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JOURNAL OF THE PROCEEDINGS

OF THE

LINNEAN SOCIETY OF LONDON.

Contributions to the Orchidology of India.—No. II.

By Professor LINDLEY, F.R.S., F.L.S., &c.

(Continued from vol. i. p. 190.)

[Read March 4th, 1858.]

DENDROBIUM, *Swartz.*

THIS great Indian genus varies extremely in the habit of its numerous species,—some being little larger than the mosses among which they grow, while others are surpassed in stature by few of the Order. Like the *Oncidia* of the New World, there are some species of which the foliage is ancipitous, others having it terete, while in the majority it is in the usual flat condition. A few have no other stem than a wiry creeping rhizome; others have small conical pseudo-bulbs; many form clavate horny stems, leafy only at the summit; but the greater part produce long leafy branches. In the majority the colour of the flowers is some shade of purple; a few are destitute of all colour except green; and a rather considerable group is especially distinguishable by the rich yellow tint of their blossoms. Of such distinctions advantage has been taken in the following sketch of the entire genus, now consisting of more than 200 species, of which I have examined the larger part. In this all the species agree, that there are only four pollen-masses, nearly equal in size, and of uniform breadth at either end. On the contrary, the *Erias*, which in some cases have been mistaken for *Dendrobium*, have the pollen-masses pyriform, so that when, in the herbarium, a specimen has lost a part of its pollen-masses, as is frequently the case with *E. muscicola*, *Dalzelli*, &c., its true genus may still be determined. It is mainly because *Sarcostoma* has the pyriform pollen-masses of an *Eria*, although their number is that of *Dendrobium*, that I now hesitate to reduce it to the latter genus.

In forming the sections now proposed, it will be seen that a regular sequence of the most nearly allied forms is not wholly obtained. However desirable, indeed, such an arrangement may be in theory, it is certainly unattainable in practice in cases where great numbers of species are brought together; for the points of resemblance and difference are so various and complicated, that, like countries in a geographical map when placed in a continuous series, some must of necessity be dissevered from those to which they are conterminous in nature. Thus the *Bolbodia*, forming a natural group among each other, run into *Stachyobium* as much as into *Eudendrobium*, next which the section is placed; and such species as *D. Dalhousieanum* are much allied to the Holochrysals. It would, moreover, be desirable to collect into one subdivision such species as *D. excisum*, *metachilinum*, *Tmesipteris*, *lycopodioides*, &c., now forming a part of *Eudendrobium*; but I do not at present see what combining characters are available for the purpose.

The following Table brings into one view the distinctions of the groups under which the annexed memoranda are collected:—

Folia verticalia (scalpellifolia) .... 1. APORUM.
—— teretia .... 2. STRONGYLE.
—— horizontalia.
  Caulis nullus, rhizoma tantum .... 3. RHIZOBIUM.
  —— apice tantum 1–3-phyllus. Folia coriacea... 4. DENDROCORYNE.
    a. labello continuo.
    b. labello in crinibus soluto (*Desmotrichum*).
  Caulis undique foliatus:
    Flores omnino aurei .... 5. HOLOCHRYSA.
    —— rosei aut candidi, labello tantum quandoque luteo.
      Mento nullo .... 6. ACLINIA.
      —— producto:
        Flores fasciculati aut solitarii:
          a. Caule brevissimo, conico (*Bolbodium*).
          b. Caule elongato .... 7. EUDENDROBIUM.
        Flores dense racemosi, mento elongato 8. PEDILONUM.
        Flores laxe racemosi, mento brevi:
          petalis conformibus .... 9. STACHYOBIUM.
          petalis elongatis spathulatis ....10. CERATOBIUM.

§ I. Aporum, *Blume*.

The ancipitous leaves clearly distinguish this group from all other Dendrobia. The genus *Oxystophyllum* differs in nothing except having only two globose pollen-masses instead of four. *D.* (Aporum) *sinuatum* of the 'Bot. Register, 1841, Misc. No. 3,' which has quite the habit of *Ox. carnosum*, seems to connect the two genera; for although it has four pollen-masses, two are much smaller than the others, as if rudimentary*.

* *Flores terminales et laterales. Caules apice sæpe aphylli.*

72. D. (A.) micranthum (*W. Griffith, in Calcutta Journal of Natural History*, iv. 376; *Ib.* v. 369).
Java, *T. Lobb.*

His erroneous description of the lip of this plant was corrected by Griffith in a later paper: the specimen in my herbarium which I refer to here differs in the lip being too broad to be called "linear-oblong"; but I have seen nothing else to which Griffith's description will apply.

73. D. (A.) Serra, *Lindl. Gen. & Sp. Orch.* No. 5.
Java, *T. Lobb.* in hb. Hooker.

A flower in the Hookerian Herbarium shows this to be the *Macrostomium aloifolium*, Blume, which is confirmed by one of Kuhl and Hasselt's unpublished drawings. It is, however, not the *Herba supplex quinta* of Rumphius, as I formerly suspected, the figure of that plant certainly representing *D.* (*A.*) *subteres*. According to Griffith this is also the *Dend. acinaciforme*, Roxb.

74. D. (A.) Lobbii: caulibus apice aphyllis, foliis scalpelliformibus duplo longioribus quam latis; floribus minutissimis terminalibus; sepalis recurvis; labello erecto carnoso trilobo; lobis lateralibus brevioribus unguiculato.
Borneo, forests of Labuan, *T. Lobb.*

This looks like a very small state of *D. Serra*; but the leaves are more distant and rather narrower, the sepals are recurved, and the lip quite different in form. The flowers are not larger than those of the smallest *Oberonia*. The whole plant forms a tuft little more than 2 inches high.

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* Prof. H. G. Reichenbach reduces *Oxystophyllum* to *Dendrobium*. Neither the materials with which he has favoured me nor those in my own herbarium enable me to form a decided opinion on the subject. In fact that whole genus, if it be one, is in inextricable confusion. A fragment of Blume's *Sarcostoma*, and a drawing of the details of its structure, for which I am also indebted to my learned friend, seem to show that that genus should be preserved. The pollen-masses are represented as having long tails, and have no resemblance to Blume's figure.

75. D. (A.) anceps, *Wallich, Catalogue*, No. 2020.

My flowers of this are unexaminable. It cannot be the *D. anceps* of Roxburgh, which has lateral flowers only.

76. D. (A.) LUNATUM: foliis scalpelliformibus densis obtusiusculis, labello lunato ante unguem canaliculatum crista transversa instructo.
Philippines, *Cuming*.

Flowers scarcely larger than in *D.* (*A.*) *Lobbii*. The lip is quite unlike that of any other of the section.

76*b*. D. parciflorum, *Rchb. f. MSS.* (D. Jenkinsi, *W. Griffith, in Calc. Journ. N. H.* v. 367. t. 25); an Assam plant with large white terminal flowers, I have not seen.

77. D. (A.) subteres, *Griffith in Calc. Journ. N. H.* v. 370. (Herba supplex quinta species, *Rumph. Amb.* vi. t. 51. f. 2?)
Malacca, *Griffith*.

This is a very distinct plant, with the long slender leafless terminations of its shoots yellow, polished, and remarkably flexuose.

78. D. (A.) Roxburghii, *Griffith, l. c.* (Dend. Calceolum, *Roxb. Flor. Ind.* iii. 370. Herba supplex femina, *Rumph. Amb.* vi. t. 51. f. 1.)
New Guinea, *Hindes*; Amboyna, *Roxburgh*.

Judging from the account of this plant given by Griffith, it must be a very distinct plant, with "large dull-orange flowers slightly veined with dull red." The lip, he adds, is represented as almost 4-lobed, or 3-lobed with the central lobe emarginate. In my specimen, without flowers, the long leafless branches are straight, not flexuose, and the distant leaves when full-grown are thin, $1\frac{3}{4}$ inch long by $\frac{2}{10}$ of an inch wide. The figure in Rumphius makes them broader.

** *Flores laterales tantum.*

79. D. (A.) anceps, *Roxb. Flor. Ind.* 487; *Griffith in Calc. Journ. N. H.* v. 369; *Bot. Mag.* t. 3608; *Bot. Reg.* t. 1239; *Bot. Cab.* t. 1895, not of Wallich's Catalogue.
Sikkim, hot valleys, *J. D. H.* (14).

80. D. (A.) cuspidatum, *Wallich in Bot. Reg.* 1841, *Misc.* 7.
Khasija, at 2000 feet, *J. D. H. & T. T.* (14 in part); Moulmein, *T. Lobb.*

Perhaps this is not distinct from *D. anceps*, with which it is mixed in the Khasija specimens; but its long naked terminal shoots, narrower leaves, much smaller flowers, and almost flabelliform lip, seem to be sufficiently different.

81. D. (A.) EULOPHOTUM: foliis crassis scalpelliformibus obtusiusculis approximatis; labello rotundato crista maxima transversa utrinque acuta.

Mergui, *Griffith*; Java, *T. Lobb* in hb. Hooker.

Of this I have a carefully prepared drawing by Griffith. Its great transverse crest on the lip resembles nothing except what is found in *D. indivisum* of Blume; but that plant, the *Schismoceras distichum* of Presl, has terminal capitate flowers. The Java plant is rather different, the apex of the lip being deeply and widely retuse, while Griffith's plant is, according to his drawing, regularly rounded; but I see no other difference.

§ II. STRONGYLE, *Lindl. in Paxt. Fl. Gard.* i. sub t. 27.

Under this are included all the species with terete leaves. Some occur among the collections from continental India. I have one or two to add to those already on record.

82. D. UNCATUM: foliis rigidis triquetris brevibus distichis retrorsum uncatis acutis; labello obovato bilobo intra sinum obsolete tristiche papilloso.

Java, *T. Lobb* (156).

This differs from *D. subulatum* in its strongly hooked leaves, broader, more emarginate lip, and larger flowers. Nevertheless Prof. Reichenbach, who saw both in my herbarium, does not distinguish it. (See *Bonplandia*, March 1, 1857.) It is not unlike a small form of *D. subteres*.

§ III. RHIZOBIUM, *Lindl.*, *l. c.*

Of this there is no Indian species.

§ IV. DENDROCORYNE, *Lindl. in Bot. Reg.* 1844, t. 53; 1847, t. 36. *Paxton, l. c.*

This section must be confined to the species with stems or pseudo-bulbs bearing leaves at the apex only, and always of a thick leathery structure. What I have formerly called *Desmotrichum*, only in part the same as Blume's genus of that name, have for their character the same vegetation, with a lip whose middle lobe is broken up into long threads.

* *Flores terminales. Labellum margine continuum.*

83. D. Macræi, *Lindl. Gen. & Sp. Orch.* No. 3. (? D. nodosum, *Dalzell in Hook. Journ.* iv. 292.)
Ceylon, *Macrae*; Nilgherries, Madras Herbarium, *J. D. H.* (27)?; Khasia, at the height of 4000 feet, *J. D. H.* (26)?

The flowers of *D. Macræi* were described as having an entire lip, upon the faith of a Cingalese native drawing. It is, however, very doubtful whether such is their structure, and I can hardly doubt that Dalzell's *D. nodosum*, of which I have examined perfect flowers out of the herbarium of my late lamented friend Dr. Stocks (No. 30), is the same plant. Its leaves, indeed, are narrower, and its pseudo-bulbs less unequal-sided, in the specimens before me. Of Dr. Hooker's No. 26, from Khasia, the flowers are unknown, but are said to be solitary and white; the leaves are not half the width of *D. Macræi*, and the pseudo-bulbs are so slender as to be scarcely distinguishable from the main stem. All are nearly allied to *D. flabellum* of Reichenbach.

84. D. PUMILUM (*Griff. Notul.* iii. p. 315); pseudobulbis clavatis tetragonis nitidis diphyllis, foliis brevibus ovato-oblongis obtusis, floribus inter squamas subsessilibus, sepalis petalisque acuminatis, mento attenuato incurvo ovario subæquali semifisso, labello unguiculato oblongo nudo dimidia superiore acuminata crispa.
Mergui, on trees, *Griffith* (24 and 1175).

Flowers small, white, sweet-scented, according to Griffith, whose description is, however, not quite exact. In habit it resembles *D. tetragonum.*

85. D. LABUANUM; pseudobulbis parvis diphyllis secus caulem arcte adpressis, foliis obtusis anguste ovalibus obtusiusculis, floribus solitariis, labello trilobo intra apicem papilloso axi elevata carnosa abrupta.
Borneo, *T. Lobb.*

This is related to *D. cymbidioides* and its allies, but the flowers are much smaller.

86. D. BRACHYPETALUM; pseudobulbis parvis monophyllis secus caulem arcte adpressis, foliis obtusis, floribus geminis subsessilibus, sepalis acuminatis, petalis acutissimis duplo brevioribus, mento brevi, labello brevi oblongo acuto bicarinato.
Java, *T. Lobb* in hb. Hooker.

A small species with flowers not larger than in an Oberonia. The short acute petals and lip are unusual.

87. D. RABANI; pseudobulbis subcylindraceis monophyllis secus caulem imbricatis, folio oblongo obtuso, floribus parvis sessilibus terminalibus, sepalis petalisque acutis æqualibus, mento brevi, columna bicamerata, labello basi excavato lævi lamina intus villosa medio tuberculata.
Khasia, in Mr. Raban's garden, at 4000 feet, *J. D. H.* (25).

"Flowers small, white, sweet-scented." I have been unable to ascertain the form of the lip; but the other characters are amply sufficient to distinguish this.

** *Flores laterales. Labellum margine continuum.*

Some of the supposed species of this section are probably founded on insufficient grounds. *D. Farmeri* (Bot. Mag. t. 4659), for instance, is scarcely distinct from *D. chrysotoxum* (Bot. Reg. 1847, t. 36), although its flowers are tinged with pink, and its lip less abundantly fringed. In like manner my *D. palpebræ* (Journ. Hort. Soc. v. 33) may be a white-flowered variety of *D. Griffithianum* (Bot. Reg. xxi. 1756). The only species among the collections of Hooker and Thomson is—

88. D. densiflorum, *Wallich, Plant. As. rar.* t. 40; *Bot. Mag.* t. 3418.
Sikkim, at 1000–5000 feet of elevation, *J. D. H.* (7 and 150); Khasia at 2000–4000 feet, *J. D. H. & T. T.* (7).

89. D. EUPHLEBIUM (*H. G. Rchb. MSS.*); caule angulato clavato basi angustato, foliis geminis membranaceis ovali-lanceolatis, flore solitario laterali, labello oblongo unguiculato concavo emarginato cordato, venis ab axi carnoso rectangulis divergentibus.
Java, *T. Lobb.*

A very distinct plant, remarkable for its clavate angular stem tapering to the base, and solitary lateral flower.

*** *Labelli lobus medius stuposus* (Desmotrichum).

The species hitherto known are wholly insular.

§ V. HOLOCHRYSA.

* *Fasciculata;* floribus solitariis, fasciculatis aut breviter racemosis.

In proposing now, for the first time, to collect into one group all the distichous-leaved yellow species, I have no character to rest upon except the uniformly yellow colour of all parts of the flower, a colour disappearing somewhat in *D. aureum*, whose yellow almost fades into white in the variety called *D. rhombeum*, just as that of *D. Griffithianum* disappears in its variety *Palpebræ*.

* *Flores fasciculati, aut geminati, aut in racemulis 3–4-floris.*

90. D. Hookerianum; foliis ovatis acuminatis, pedunculis 3–4-floris, bracteis minutis, sepalis petalisque subæqualibus integris, labello ovato fimbriis crinitis cincto laminæ ipsæ æqualibus, ungue convoluto basi retrorsum bidentato.

Sikkim, at 1000–5000 feet, *J. D. H.* (8).

A very striking species, with flowers as large as *Dalhousieanum*, with very long shaggy fringes surrounding the labellum, which has two blood-red spots on each side above the unguis itself, furnished at the base with a double reversed tooth. There is a figure among Mr. Cathcart's drawings.

91. D. chrysanthum, *Wallich, Cat.* No. 2012; *Bot. Reg.* 1299.

Darjeeling, *Griffith*; Khasija, *Griffith*; at 3000-5000 feet, *J. D. H. & T.T.* (13); Churra, *J. D. H.*; Sikkim, in hot valleys, at 2000-5000 feet, *J. D. H.* (13).

There is scarcely any variation among the numerous specimens before us. All have the broad rounded sepals and strictly fascioled flowers so characteristic of this beautiful species. *Dendrobium Paxtoni* (Bot. Reg. 1839, Misc. 56), of which I have seen no wild specimen, differs in its longer and less rounded petals, which are slightly serrated.

92. D. ochreatum, *Lindl. in Wall. Cat.* no. 7410. (D. Cambridgeanum, *Paxton, Mag. Bot.* vi. 265; *Bot. Mag.* t. 4450.)

Khasija, *Griffith.*

Prof. H. G. Reichenbach informs me that the odd stigma is at the base of the fovea stigmatica, and not at the apex beneath the rostellum as usual,—a circumstance I have not had an opportunity of observing.

Other species of this section are *aureum*, Lindl., or *heterocarpon*, Wallich, of which *D. rhombeum*, Lindl. is a white variety; *villosulum*, Wall., or *Jerdonianum*, Wight; *Ruckeri*, Lindl.; *sanguinolentum*, Id.; *rugosum* and *salaccense*, Blume; and I suppose *intermedium* and *ochroleucum*, Tijsmann.

** *Racemosa*; racemis multifloris.

93. D. moschatum, *Wall. Pl. As.* ii. p. 83.; *B. M.* t. 3837.

Khasija, at 4000 feet, *J. D. H. & T. T.* (16).

94. D. fuscatum; foliis oblongo-lanceolatis acutissimis, racemis filiformibus flexuosis, bracteis linearibus herbaceis, petalis sepalisque subæqualibus oblongis rotundatis, labello oblato cucullato retuso denticulato ciliato.

Sikkim, *Cathcart*, in hot valleys, *J. D. H.* (12); Khasija, at 2000–4000 feet, *J. D. H. & T. T.* (12).

This remarkable plant has orange-brown sepals, and in the shape of its parts is like *D. chrysanthum*, but with ten or twelve flowers in a slender raceme. The petals are orange-yellow, as also is the lip, which has two crimson spots on each side. The flowers of the Khasija specimens are smaller than in those from Sikkim.

§ VI. Aclinia, *Griffith, Not.* iii. 320.

In retaining this supposed genus as a section of *Dendrobium*, I must at the same time observe that the species are probably Pelorias of others, although, with perhaps one exception, their parentage cannot be traced. They are all characterized by a perfect, or nearly perfect, regularity in the inner as well as outer series of floral envelopes, one result of which is the loss of the mentum, which belongs to all the other plants collected under the genus. In the case of *D. normale*, the column seems to be always triandrous; and in *D. Pseudaclinia*, there is sometimes an apparent attempt to gain that structure. It is, however, for Indian botanists to investigate this curious subject, and trace the monsters, if monsters they are, to their origin. Prof. H. G. Reichenbach has discovered that Endlicher's genus Thelychiton, founded on a terrestrial Norfolk Island plant, is one of these Aclinias. Judging from a tracing from Ferdinand Bauer's drawing in the Vienna Museum, it seems possible, perhaps probable, that this plant (*Dendrobium macropus*, H. G. Rchb.) is a Peloria of *D. elongatum*, A. Cunn. (*D. brisbanense*, H. G. Rchb.). I also much suspect my genus *Paxtonia* to be nothing more than a Peloria of *Spathoglottis spicata.*

95. D. Aclinia. (Aclinia, *Griff. Not.* iii. 320. t. 351 A. fig. 21.)
Mergui, *Griffith* (809).

I can have no doubt that this is a Peloria of *D. incurvum* (*infra*, No. 133), which seems to have been gathered by Griffith in the same place on the same day. The flowers are in pedunculate divaricating secund racemes, and appear to have been white, as Griffith describes them.

96. D. Pseudaclinia. (Dend. Aclinia, *Rchb. f. in Bonpl. Oct.* 15, 1856.)
Bootan, *Hort. Kew.*

This has flowered with Consul Schiller at Hamburg as well as at Kew; and Prof. Rchb. informs me that it has also been received by the same great cultivator from Manilla. It is a slender erect plant with yellow flowers, springing in pairs or singly from the sides of the stem. I have before me a sketch by Rchb. made at

Hamburg, and another of my own dated Sept. 1854, in both which the stigmatic hollow is concealed by a tooth-like elevation of its lower edge, a structure also occurring in *Thelychiton* and *D. normale*; in the Kew plant there was, moreover, a bristle on one side of this front tooth, and external to it; but Prof. Reichenbach did not find it in many fresh flowers examined by himself, nor does either the bristle or the front tooth occur in the original *Aclinia*. The meaning of these malformations opens a curious field of inquiry, to which I hope to address myself on a future occasion.

97. D. LAWANUM; caule juniore carnoso ascendente foliis membranaceis lanceolatis acutis, florido aphyllo vaginis laxis membranaceis fere abdito, sepalis petalisque ovatis obtusiusculis, labello paulo majore conformi concavo. (Dendrochilum roseum, *Dalzell in Hooker's Journal*, iv. 291.)

On trees on the Syhadree range of mountains, *Dalzell in hb. Stocks* (31); Concan, *Law in hb. Hooker* (2).

Mr. Dalzell states that in this plant, "across the front of the column and below the orifice of the stigmatic cavity, there is a small crest terminated on each side by a deeply-coloured horn, two- or three-toothed at the apex." This seems as if we had here also some monstrous structure; but I am unable to refer the plant to any of the Eudendrobia, unless indeed *D. transparens* should claim it; and I must add, that there was nothing unusual in the column of the only flower I have had an opportunity of dissecting.

98. D. TETRODON (*H. G. Rchb. in litt.*); caulibus floridis tenuibus pendulis aphyllis junioribus foliis anguste lanceolatis membranaceis subobliquis, floribus geminatis, sepalis petalisque lineari-lanceolatis acutissimis, mento obsoleto, labello conformi paulo majore et obtusiore, clinandrio quadridentato.

Java, on trees at the foot of M. Salak, *Zollinger* (11).

Of this I have a good specimen from Prof. Reichenbach. It has the habit of such a plant as *D. transparens*; and there is a slight tendency to the extension of the lateral sepals at the base. Can it be a Peloria of *D. macrostachyum*? I find nothing monstrous in the column.

99. D. normale, *Falconer in Ann. Nat. Hist.* iii. 196; *Griffith, Not.* iii. 255. t. 284.

Western Himalayas; Mussooree and Landour, *Col. Vicary*; pass near Paoree in Gurwhal, at 4000-6000 feet, *T. Thomson* (17); Saharunpur, *Falconer*.

My examination of this singular plant agrees with Dr. Falconer's description. Although a monster, I am unable to indicate the species to which it may possibly belong. Suspicion points to *D. fimbriatum*; but that species seems to be quite an eastern plant, while *D. normale* has hitherto been seen only in the Western Himalayas. The late Col. Vicary informed me that the specimens which he first found, and from which Dr. Falconer's description was taken, were gathered in 1832, in the vicinity of Mussooree and Landour.

§ VII. EUDENDROBIUM, *Lindley, in Paxton's Fl. Gard.* i. sub t. 27.

I have no other change to make in the limits of this large section than the exclusion of all the species with great yellow flowers, which now stand in the first section of *Holochrysa*.

A. *Caule* 0, *v. brevissimo carnoso* (Bolbodium, *Lindl. l. c.*).

No species are among the Hookerian collections. The following are new.

100. D. SUBACAULE, *Reinwardt, MSS.*; folio parvo oblongo pedicellis geminatis breviore, sepalis petalisque acuminatis, labello nudo latiori subconformi, mento gracili recto petalis duplo longiore, ovario triptero.
Java, on the top of Mount Tidore, *Reinwardt*.

Whole plant, the vermilion flowers included, is little more than an inch high. This is the smallest of the genus.

101. D. PRASINUM; folio ovali obtuso, floribus solitariis, sepalis lanceolatis petalisque ovatis acutissimis, mento brevi obtuso, labello unguiculato auriculato rhombeo acuminato concavo nudo bilineato.
Feejee islands, 2000 feet above the sea, *Asa Gray*.

A very distinct plant, of which I only know a drawing by Agati, in the possession of my learned friend Prof. Asa Gray. The flowers are sea-green, nearly two inches in diameter. The sepals about $\frac{3}{8}$ of an inch wide.

102. D. extinctorium, *Lindl. in Bot. Reg.* sub t. 1756.
Moulmein, *Griffith*, on Careya arborea, in damp places.

A true *Dendrobium*, as is shown by its pollen-masses. Pseudobulbs depressed. Peduncles filiform, erect, 2 to 3 inches long, one-flowered, with a minute bract about an inch off the ovary.

B. *Caule elongato.*

* Labello integro.

This group consists of numerous species so nearly related to each other that it is scarcely possible to find good distinctions for them. Even when seen alive in their natural state, the uncertainty is the same. "All the species," says Griffith, "with cochleate labella are nearly akin; they run into each other so much, that distinguishing marks are very difficult." (Itinerary Notes, p. 185, speaking of a form of *Dendrobium nobile* found at Panukka in Bootan.)

103. D. pulchellum, *Lindl. Gen. & Sp.* No. 35; *Bot. Cab.* t. 1935. (D. brevifolium, *Hort.* D. Devonianum, *Paxton, B.M.* t. 4429. D. pictum, *Griffith.*)
Khasija, *J. D. H.* (15); Bootan, *Griffith.*

I have this from Bootan from Griffith, under the name of *D. pictum*, but have failed to discover any trace of it in his Itinerary Notes.

104. D. Pierardi, *Roxb. Fl. Ind.* 3. 482.
Valleys of Sikkim, *Cathcart*; *J. D. H.* (5).

105. D. primulinum, *Lindl. in Gard. Chron.* 1858, no. 223. (D. nobile pallidiflorum, *Bot. Mag.* t. 5003.)
Hot valleys of Sikkim, *J. D. H.* (154).

Possibly this is not distinct from *D. cucullatum*, as is suggested in the work above referred to.

106. D. transparens, *Wallich, Cat.* No. 2008. (D. Henshalli, *Rchb.* f.; *Bot. Mag.* t. 4663.)
Sikkim, at 2000 feet, *J. D. H.* (153); on rocks towards Chuka, in Bootan, and near Murichom, at 3500 to 4000 feet, *Griffith.*

I am unable to distinguish the Sikkim specimens from this plant, although they are somewhat larger than such as have appeared in our gardens; there can be no doubt that it is the No. 1135 of 'Griffith's Itin. Notes,' p. 198, and Prof. Rchb. has himself pointed out the identity of his *D. Henshalli.*

107. D. amœnum, *Wallich, in Lindl. Gen. & Sp. Orch.* p. 78.
Sikkim, *Cathcart* (*Ic.*).

This is readily known by its narrow, blunt, nearly equal sepals and petals, each with a purple stain at the point.

108. D. nobile, *Lindl. Gen. & Sp. Orch.* 24. (D. cærulescens, *Lindl. Sert. Orch.* t. 17.)
Khasija, *Griffith, J. D. H.*; Darjeeling, *Griffith*; Assam, *Id.*

Evidently variable in the size, and probably in the colours, of the flowers. It is the No. 940 of Griffith's Itin. Notes, p. 184.

109. D. Lindleyanum, *Griffith, Not.* iii. 309.
Hot valleys in Sikkim, at 1000–5000 feet of elevation, *J. D. H.* (6).

This, notwithstanding the size of the flowers, which are twice as large as in *D. nobile*, is probably a mere variety of that species.

110. D. FURCATUM (*Reinwardt*); caule gracillimo, foliis linearibus apicem versus angustatis obtusis, sepalis ovatis obtusis, petalis unguiculatis cuneatis retusis latioribus, labello lanceolato acuto nudo intra mentum rectum sepalis longiorem clausum fere abdito.
Celebes, *Reinwardt*.

A remarkable plant, which, because of the sepals almost completely united into a long chin, might be perhaps better referred to *Pedilonum*. I have only seen fragments of a stem and leaves, and a perfect flower. The broad cuneate petals are very characteristic.

111. D. DISTACHYON; foliis distichis linearibus oblique bidentatis basi latioribus, floribus solitariis, axillaribus subsessilibus, sepalis petalisque angustioribus acutis, labelli ungue lineari-elongato lamina oblata nuda.
Borneo, *Thomas Lobb*.

This and the two following resemble *D. excisum*, *revolutum*, and *metachilinum* in habit.

112. D. LYCOPODIOIDES; foliis distichis densis linearibus apice obliquis apiculatis, floribus solitariis, bracteis lineari-lanceolatis carinatis pungentibus, sepalis acutissimis lateralibus latis triangularibus, petalis angustioribus minus acutis mento subrotundo, labello sessili obovato concavo apiculato lamellis 2 maximis carnosis.
Borneo; forests of Sarawak, *T. Lobb*.

Very like one of the larger *Lycopodia*. Flowers scarcely more than 2 lines long. Both this and the following are distinguished by two fleshy parallel plates almost as broad as the lip itself on which they lie.

113. D. TMESIPTERIS; foliis distichis distantibus linearibus apice obliquis, floribus solitariis, bracteis lineari-lanceolatis carinatis pungentibus, sepalis acutissimis dorsali apice recurvo lateralibus antice arcuatis, petalis angustioribus acutissimis subfalcatis, mento oblongo prominente, labello sessili obovato concavo mucronato margine apicis membranaceo crispulo lamellis 2 maximis carnosis.
Borneo; forests of Sarawak, *T. Lobb*.

Very like a *Tmesipteris*. Differs from the last in the flowers being even smaller, as well as in the points above described.

114. D. SPINESCENS; caulibus erectis, foliis distantibus oblongo-lanceolatis, pedunculis oppositifoliis squamosis demum spinescentibus, sepalis labelloque oblongis obtusis, petalis conformibus triplo minoribus. (*Cymbidium spinescens*, Ic. Reinwardt.)
Java? *Reinwardt*.

Very different, in its flowers having the sepals spreading and ¾ of an inch long, from any of the allied species. According to Reinwardt's drawing, the fruit is nearly cylindrical, angular, and surmounted by the sepals, petals, lip, and column, much enlarged and become quite green. There is no specimen in the herbarium of Reinwardt.

** Labello trilobo; *calvæ*.

115. D. BREVIFLORUM; fasciculo florum sessili subgloboso, sepalis petalisque duplo brevioribus carnosis obtusissimis, labello oblato nudo lobis lateralibus falcatis auriformibus intermedio truncato plica utrinque sub sinubus.
Singapore? *Herb. Loddiges*.

I know nothing like this, which flowered in 1844, in the nursery of Messrs. Loddiges. The flowers are white, fleshy, with stripes of crimson spots.

116. D. stuposum, *Lindl. in Bot. Reg.* 1838, *misc.* 94.
Khasija mountains, at 2000–4000 feet of elevation, *J. D. H. & T. T.* (11).

The lip is 3-lobed, not entire as is stated in the original definition taken from an imperfect garden specimen, which led Prof. Reichenbach to suppose that his *D. sphegidoglossum* was different,—a mistake the blame for which is mine.

117. D. Blumei, *Lindl. Gen. & Sp. Orch.* No. 65. (Onychium fimbriatum, *Blume, Bijdr.* p. 325. Dend. planibulbe, *Lindl. in Bot. Reg.* 1843, *misc.* 70.)
Java, *Zollinger*; Manilla, *Loddiges*.

An authentic fragment from Prof. Reichenbach shows that the Manilla plant is identical with that from Java.

118. D. aqueum, *Lindl. in Bot. Reg.* 1843, *misc.* 6. t. 54; *Bot. Mag.* t. 4640. (D. album, *Wight, Ic.* t. 1645.)
Khasija hills, *T. Lobb*.

This is not to be found in the collections of Hooker and Thomson; nor have I seen any wild specimens, except a few flowers sent home by Mr. Thomas Lobb to Messrs. Veitch. These want the long hairs represented by Dr. Wight's artist, but agree perfectly with the figure in the Botanical Magazine. *D. ramosum*, an obscure plant with a slender pendulous branched stem and lanceolate acuminate leaves, is apparently near this; but the fragments of flowers before me afford little information except that the lip is broad with fine hairs on the inside near the edge.

119. D. SPATHACEUM; caulibus gracilibus erectis, foliis anguste oblongis apice oblique obtusis, bracteis linearibus membranaceis basi coloratis, sepalis petalisque æqualibus acutis mento brevi rotundato, labelli angusti lanceolati laciniis lateralibus rotundatis medio tuberculatis ad sinus plicatis intermedia duplo longiore acuta.

Sikkim, at the height of 6000 feet, *J. D. H.* (143).

A solitary specimen of this exists in Hooker's herbarium; the stems are about 6 inches long, and the flowers (apparently solitary) the size of those of *D. macrostachyum*.

120. D. SCABRILINGUE; foliis oblongis apice obtusis valde obliquis, floribus geminatis, sepalis petalisque ovalibus æqualibus, mento conico, labelli 3-lobi medio pluries canaliculati lobis lateralibus semiovatis obtusis intermedio carnoso oblongo scabro multo brevioribus.

Borneo, *T. Lobb.*

A pair of flowers and a single leaf, communicated by Messrs. Veitch, are the materials on which this very distinct species is established. Its structure is, however, so peculiar, that no doubt can exist of its perfect distinctness from any other yet known. The flowers appear to be white. The lateral sepals from the point of the mentum to their own apex are about an inch long.

121. D. TRUNCATUM; caulibus gracilibus ramosis basi ramulorum subrotundis incrassatis, foliis linearibus oblique emarginatis, floribus solitariis, sepalis petalisque ovatis acutissimis æqualibus, mento ascendente valde obtuso ovario duplo longiore, labelli laciniis lateralibus semicuneatis intermedia lineari basi unidentata.

Java, *Reinwardt, Lobb.*

I find this among Reinwardt's plants under the name of *Ophrys pubescens* of Blume; probably owing to some error in labelling, for there is no such name known to me, nor has this any structure that can be called pubescent. It is a very small-flowered slender species, closely allied to *D. tetraedre*, from which it differs in the labellum, and in the thickened bases of the branches being round or roundish oblong, not at all angular.

122. D. INVOLUTUM; caulibus teretibus, foliis ovato-lanceolatis oblique obtusis, gemmis oppositifoliis conicis, sepalis petalisque lineari-lanceolatis æqualibus acuminatis apice incurvis, mento brevi acuto, labelli laciniis lateralibus acutis falcatis intermedia revoluta crispa acuminata brevioribus.

Society Islands, pendulous from the branches of trees, *Mathews.*

Flowers a quarter of an inch long, with the points of all the divisions hooked or rolled downwards.

*** Labello trilobo; *nigro-hirsutæ.*

These species are all distinguished by the presence of short black hairs on the young stems, a peculiarity which separates them from everything except *D. furcatum.*

123. D. formosum, *Roxb. Flor. Ind.* iii.; *Wallich, Pl. As.* t. 39; *Bot. Reg.* 1839, t. 64.
Khasija, *J. D. H. & T. T.* (1007); *T. Lobb* (373). Moulmein, *Griffith* (350).

124. D. INFUNDIBULUM; foliis lanceolatis angustis acutis, sepalis lineari-oblongis, petalis oblongis obtusis triplo latioribus, mento infundibulari pedicello æquali, labelli lobis lateralibus rotundatis integris intermedio subrotundo plano serrulato emarginato.
Moulmein, at 5000 feet on Thoung-gyun, *T. Lobb, in hb. Hooker.*

A very striking plant, intermediate between *D. formosum* and *longicornu*, having the large flowers of the former and the slender habit and narrow leaves of the latter. The lip with large round lateral lobes also distinguishes it from the former, and the large petals with a circular middle lobe to the lip and short funnel-shaped mentum from the latter.

125. D. longicornu, *Lindl. in Wall. Cat.* 1997; *Bot. Reg.* t. 1315. (D. flexuosum, *Griffith, Notul.* iii. 317. D. hirsutum, *Id.* iii. 318. t. 305.)
Khasija, *T. Lobb, Griffith*; at 4000-6000 feet, *J. D. H. & T. T.* (10); Sikkim, inner valleys at 5000 feet. *J. D. H.* (10); Assam, *Griffith.*

A variable plant as to the form of the middle lobe of the lip, which is broken up into fringes in very unequal degrees, and as to the size of the flowers, which however appear to have always a membranous lip, with strong orange-coloured veins on the lateral lobes.

126. D. XANTHOPHLEBIUM (*Lindl. in Gard. Chron.* 1856, no. 196); caule foliisque *D. longicornu*; sepalis petalisque linearibus acutis, mento brevi, labelli carnosi lobis lateralibus triangulis obtusis intermedio ovato dilatato apiculato crispo scabro: axi elevata carnosa.
Moulmein, *T. Lobb* (176, 177).

Flowers much smaller than in the last, with quite a different, fleshy not membranous, lip. Flowers white. Lip yellow with orange-coloured veins and disk. It is cultivated by Messrs. Veitch.

127. D. ATTENUATUM; foliis linearibus gramineis patentissimis, floribus solitariis squamulis minutis obtusis, sepalis petalisque obtusiusculis, mento lineari obtuso, labelli elongati spathulati lobis lateralibus dentiformibus intermedio subrotundo margine carnoso medio subaspero tuberculis geminis linearibus.

Borneo, *T. Lobb.*

Flowers small, apparently white. Leaves long, narrow, and grassy. Stems slender, ascending, from 6 to 8 inches high.

⁂ The only other species of this section are *D. calcaratum* (Bot. Reg. 1840, misc. 218) and *D. nutans* (Gen. & Sp. Orch. No. 73), whose lip is not undivided as it was supposed to be, but lanceolate with short entire lateral lobes and a crisp, almost linear, middle part, as I learn from specimens communicated by my learned correspondent Mr. Thwaites (156).

§ VIII. PEDILONUM, *Blume.*

No continental species of this section have been observed, nor have I found among the collections examined by me anything like Roxburgh's *D. purpureum*, a Molucca plant. The following are new insular species.

128. D. AUROROSEUM (*Rchb. f. in litt.*); foliis angustis ovato-lanceolatis acutis, sepalis petalisque æquilongis acutis, mento elongato obtusissimo, labello nudo oblongo apice dilatato retuso utrinque reflexo ungue unituberculato.

Java, *T. Lobb*; *Zollinger* (231).

The oval lip, suddenly expanded into a broad apex reflexed on each side, and the extremely broad mentum, are like nothing elsewhere in this section. The flowers are the size of *D. Pierardi.*

129. D. BURSIGERUM; foliis oblongis acutis, spicis cylindraceis densifloris, sepalis petalisque acutis, mento arcuato infra apicem ventricoso, labello spathulato acuto cucullato.

Philippines, *Cuming.*

Like *D. secundum*, but flowers are not half the size, and in longer, slenderer, not secund spikes. Lip apparently white with an orange-yellow tip.

130. D. REINWARDTI; foliis anguste oblongis obtusis apiculatis, spicis densissimis brevibus, bracteis setaceis divaricatis, sepalis acutis, petalis obtusiusculis, mento duplo longiore apiculato, labello nudo angusto spathulato obtusiusculo.

Banda, *Reinwardt.*

Near *D. viridiroseum* of Rchb. f., from which it differs in its longer apiculate mentum, and in the blunt lip not at all contracted in the middle.

§ IX. STACHYOBIUM, *Lindl. in Paxton, Fl. Gard.* i. sub t. 27.

* *Labello integerrimo.*

131. **D. Dalhousieanum**, *Paxton, Mag. Bot.* xi. t. 145; *Bot. Reg.* 184, t. 10.

Mergui, *Griffith* (Dendr. No. 7, *Notul.* iii. 313).

An authentic specimen from Griffith shows that this fine species was described by him in the place above quoted; and thus its native country is now ascertained.

132. **D. ramosissimum**, *R. Wight, Ic.* 1648.

S. Concan, *Dalzell in hb. Hooker.* (*Stocks*, 52).

This is very near my *D. herbaceum* (Bot. Reg. 1840, misc. 153); but the flowers are white with a yellow lip, not white tinged with green; the lip itself is longer and more fleshy, and the flowers are considerably smaller. I have examined fresh specimens out of Mr. Bellenden Ker's garden from Dharwar.

133. D. INCURVUM; foliis angustis membranaceis oblique obtusis apiculatis, racemis oppositifoliis rectiusculis brevioribus, bracteis membranaceis uninerviis pedicellis æqualibus, sepalis angustis acutissimis antice cum mento semiaperto acuto arcuatis, petalis angustioribus, labello oblongo venoso antice serrato circa discum 2-denticulato.

Mergui, *Griffith* (808).

This is the *Dendrobium* No. 9 of Griffith's Notul. iii. 314, forming the number succeeding to that of his *Aclinia*, and apparently gathered in the same place. It has so entirely the appearance of that plant, that, as has been already observed, it is difficult to doubt that it is not the customary state of the species, notwithstanding the very different structure of the flower.

134. D. PORPHYROCHILUM; caulibus brevibus cæspitosis tetraphyllis, foliis angustis membranaceis racemis terminalibus multifloris sæpius æqualibus, bracteis setaceis ovario subæqualibus persistentibus, sepalis lineari-lanceolatis acuminatis, petalis paulo brevioribus, labello breviore ovato acuto concavo lineis 3 elevatis, mento brevissimo rotundato.

Assam, *Griffith*; Khasija hills, *T. Lobb*; at 4000–6000 feet, *J. D. H. & T. T.* (28).

"Sepals dirty pale yellow. Petals the same, with small red streaks at the base. Lip purple with a yellow margin."—*J. D. H.* The whole plant seems thin and membranous, and varies in height from 2 to 5 inches. It approaches the *Bolbodia.*

** *Labello trilobo.*

135. D. PANDURATUM; subacaule, foliis membranaceis acutissimis racemis filiformibus erectis brevioribus, bracteis minutis squamiformibus, sepalis petalisque linearibus acuminatis, mento recto conico semiaperto, labello æquilongi pandurato (trilobo lobis lateralibus rotundatis intermedio duplo majore crenulato apiculato).

Ceylon, *hb. Hooker.* (147); *Thwaites* (2353).

A small species almost referable to *Bolbodium.*

136. D. eriæflorum, *Griffith, Not.* iii. 316. t. 307.

Khasija, in Myrung Wood, on dry ridges, *Griffith* (1020), on rocks and dry trunks of trees at 2000–5000 feet, *J. D. H. & T. T.* (18).

This forms tufts from 4 to 9 inches high. The stems are covered with great loose sheaths of fallen leaves. The flowers are in dense nodding racemes; according to Cathcart's drawing, greenish yellow with purple mentum. The lip is strongly veined and edged with purple; its side lobes regularly and sharply serrated, its middle lobe small, oblate, apiculate, and entire. It would be a beautiful species in a garden.

137. D. PYCNOSTACHYUM; caulibus laxe membranaceo-vaginatis erectis carnosis, foliis ......, racemis densis cylindraceis, bracteis setaceis rectangulis persistentibus ovario æqualibus, sepalis linearibus acuminatis, petalis minoribus, mento brevi obtuso incurvo, labelli lobis lateralibus acutis integerrimis intermedio triangulari recurvo crispo parum latioribus axi juxta sinus abrupto elevato.

Moulmein, *T. Lobb.*

Like *D. eriæflorum*, but with smaller and denser flowers and a totally different lip.

138. D. microbolbon, *Ach. Richard, Ann. Sc. n. s.* xv. t. 8. (D. humile, *R. Wight, Ic.* 1643. D. crispum, *Dalzell, in Hooker's Journal,* iv. p. 111.)

Trees in Western India, *Dalzell* (*Hb. Stocks.* 34).

There is no doubt that all three of the above plants are the same. A. Richard's figure is very formal and uncharacteristic.

139. D. denudans, *Don, Prodr.* 34.

Sikkim, in the drier valleys, at 5000 feet, *J. D. H.* (20); E. Nepal, at 4000 feet, *Id.*

This varies in height from 4 to 15 inches. In the Sikkim plant the colours are bright red on a pale yellow ground, according to a drawing by Dr. Hooker; in gardens they are much greener.

140. D. PEGUANUM; caulibus ovatis cæspitosis, foliis (linearibus?), racemis erectis densis multifloris, bracteis membranaceis acutissimis

ovario longioribus, petalis linearibus falcatis sepalis multo longioribus, mento elongato, labello longe unguiculato subrotundo cochleato axi abrupta obtusa, lobis lateralibus semicircularibus intermedio parvo triangulari crispo.

Pegu, *M'Lelland in hb. Hooker.*; Borneo, *T. Lobb.*

A very small species with short erect dense racemes. The long falcate petals are very remarkable.

141. D. SARCANTHUM; caulibus cæspitosis 3–4-phyllis, foliis angustis racemo paucifloro longioribus, bracteis (testaceis) ovario longioribus, floribus valde carnosis mento horizontali obtuso, labelli 3-partiti sagittati axi elevata truncata lobis subæqualibus lateralibus oblongis intermedio ovato.

Java, *T. Lobb,* 406, *in hb. Hooker.*

It is not certain where this curious little species was found. The whole plant is only 2 inches high with slender 3- or 4-leaved stems. The rachis is very zigzag, the flowers apparently pale yellow. I have only examined a bud, the extreme softness of which rendered it difficult to dissect.

142. D. chlorops, *Lindl. in Bot. Reg.* 1844, *Misc.* 54. (D. barbatulum, *Wight, Ic.* iii. 909.)

Concan, *Law in hb. Hooker* (21); common on trees in both Concans, in the cold season, *Stocks, in hb. Hooker.*

Flowers small, yellow tinged with green.

143. D. barbatulum, *Lindl. Gen. & Sp. Orch.* No. 44; *Paxton's Fl. Gard.* 502. *Ic. Xyl.*

Concan, *Law, in hb. Hooker.* (3); trees in the S. Concan, *Dalzell, in herb. Stocks.* (32).

The woodcut in Paxton's Flower Garden shows how different this species is from the last.

§ X. CERATOBIUM.

No species of this fine division has been yet seen in continental India. Of one I have a leaf 18 inches long by 14 broad, found in Borneo by Lobb, the flowers of which are unknown; and the following undescribed species occurs among Reinwardt's drawings.

144. D. BICAUDATUM (*Reinwdt.* MSS.); foliis oblongis acutis racemis horizontalibus 4-5-floris subæqualibus, petalis linearibus spathulatis erectis sepalis multo longioribus, labelli trilobi lobis lateralibus incurvis intermedio subrotundo minoribus.

Java, *Reinwardt.*

Flowers yellowish striped with green. Lip delicately marked

with red transverse veins. Apparently the axis is fleshy, elevated, and extended as far as the point of the lip.

Obs.—Dendr. pumilum, Roxb. Fl. Ind. 479, is not the plant so called by Griffith, if the statement in the former work can be trusted; but the specific character and description are so much at variance, that some error of the Indian transcriber is to be suspected.

D. crepidatum, Griff. Notul. iii. p. 319, is quite different from the species so named by me. But the printed description is so confused and self-contradictory, that I have not been able to identify the species.

Prof. Reichenbach reduces the genera CADETIA, LATOURIA, and DICHOPUS to the present genus. I have examined no specimens of them.

CRYPTOCHILUS, *Wallich*.

145. C. SANGUINEA (*Id.*); calyce oblongo bis longiore quam lato laciniis acuminatis, petalis labelloque obovatis acutis, polliniis viridibus.
Khasija, Churra Punjee, *Griffith*, at an elevation of 4000–5000 feet, *J. D. H. & T. T.* (200); Sikkim, *J. D. H.*, *Cathcart*.

Flowers crimson. Capsule pyriform, strongly and equally six-ribbed.

146. C. LUTEA; calyce ovato longitudine et latitudine æqualibus laciniis triangularibus, petalis labelloque lanceolatis, polliniis luteis.
Mishmee, *Griffith*; Darjeeling, *Id.*; Sikkim, *Cathcart*.

This very distinct species occurs only among my specimens from Griffith and in Cathcart's drawings, according to which the flowers are of one uniform clear-yellow colour. Calyx much contracted at the mouth, and not at all longer than broad; petals linear-lanceolate; lip lanceolate. Pollen-masses yellow, not green as in the last. Capsule obscurely six-ribbed. I can find no trace of this remarkable plant among Griffith's descriptions or notes.

ACANTHOPHIPPIUM, *Blume*.

147. A. sylhetense, *Lindl. Gen. & Sp. Orch.* 177. (A. ringiflorum, *Griffith, Notul.* iii. 347. *Ic.* 325.)
Sikkim, *Cathcart*; Khasija, at the elevation of 2000–3000 feet, *J. D. H. & T. T.* (198).

Flowers straw-colour, freckled with red inside.

ANTHOGONIUM, *Wallich.*

148. A. gracile, *Wall. Cat.* 7398; *Rchb. fil. in Allg. Gartenzeit*, July 1856; *Bonplandia*, Oct. 15, 1856; *Griffith, Notul.* iii. 383, *Ic.* 345. (A. Griffithi, *Rchb. f. in Bonplandia.*)
Khasija, grassy places, 4000–6000 feet, *J. D. H. & T. T.* (199), *Lobb*; Assam, *Griffith.*

This plant varies in the breadth of the leaves, which are sometimes 9 lines and sometimes only 2 lines wide. I can find no ground for the separation of *A. Griffithi*, whose original specimens are before me.

SPATHOGLOTTIS, *Blume.*

149. S. ixioides, *Lindl. Gen. & Sp. Orch.* p. 120.
Sikkim, at an elevation of 8000–10,000 feet, *J. D. H.* (146).

"Flowers yellow." *J. D. H.*

150. S. pubescens, *Lindl.* l. c.
Khasija, *Lobb*; grassy hills at 5000–6000 feet, *J. D. H.* (145).

"Flowers yellow," *J. D. H.* I fear my Chinese *Sp. Fortuni* (Bot. Reg. 1845, t. 19) is not distinct from this, which varies greatly in the breadth of its leaves and the form of the petals.

151. S. parvifolia, *Lindl. in Bot. Reg.* 1845, sub t. 19. (S. Khasijana, *Griff. Not.* p. 323, *Ic.* t. 311. 1.
Khasija, on dry rocks near Churru, also in Assam, *Griffith.*

N.B. *Spathoglottis? trivalvis* of Wallich's Cat., No. 3742, the fruit of which alone is known, Prof. Reichenbach, jun. refers, and probably with justice, to *Acriopsis.* Griffith's *Sp. lilacina*, Not. p. 325, Ic. t. 311. 3, is *Sp. plicata*; the same author's *Sp. plicata* is *Sp. aurea.*

ARUNDINA, *Blume.*

152. A. bambusifolia, *Lindl. Gen. & Sp. Orch.* 125.
Khasija, 2000–3000 feet, *J. D. H.* (149); hot valleys, Sikkim, *Id.*

153. A. affinis, *Griffith, Notul.* iii. 330.
Khasija, at an elevation of 3000 feet, in shady wet places, on rocks near streams, *J. D. H.* (151); Churra Punjee, *Griffith.*

"Labellum yellow inside." Very like *A. chinensis*, from which it seems to differ in having only two ragged lamellæ on the lip instead of five, the lateral and middle of which are shortest. My specimens are from Griffith himself.

154. A speciosa, *Blume*. (Cymbidium speciosum, *Hb. Reinwardt.*)
Java, *Lobb* (217); Goorgong, Assam, *Griffith*; common in rocky places in wet situations on Mt. Ophir, at the height of 2500 feet, where it is called Paddam Bhattoo, *Id.*

This is principally distinguished from *A. bambusifolia* by the terminal lobes of its lip being parallel and overlapping each other, while in *A. bambusifolia* they divaricate. *A. affinis* has smaller flowers and narrower petals. *A. densa* is much more distinct, its flowers being closely arranged, and the middle lobe of the lip almost obsolete.

NEPHELAPHYLLUM, *Blume*.

155. N. cordifolium. (Cytheris cordifolia, *Lindl. Gen. & Sp.* p. 128.)
Khasija, at 4000 feet, *J. D. H.* (147).

"Flowers pale green, striped with pale purple; lip pale purple." *J. D. H.* These specimens are much larger than Wallich's from Silhet. The plant appears to spread and creep among moss, through which the leaves and flowering stem arise. In *N. tenuiflorum*, Bl., which resembles this, the flowers are much smaller as well as more numerous, and the leaves are frequently almost truncate at the base. *N. pulchrum*, Bl., which is the *Limodorum maculatum* of Reinwardt's unpublished drawings, is much dwarfer, the scape not being longer than the leaves, which are purple beneath, clouded with varying tints of green on the upper side, and in form oval-acuminate; the flowers are straw-coloured with a purple spur and a yellow crest in the middle of an undivided lip. The genus certainly belongs to *Epidendreæ*, in the neighbourhood of *Bletia*.

EULOPHIA, *R. Br.*

156. E. bracteosa, *Lindl. in Wall. Cat.* No. 7366. (E. grandiflora, *Id. Gen. & Sp.* p. 181.)
Khasija, at 2000 feet, *J. D. H. & T. T.* (222).

Further examination has satisfied me that there is no difference between the above two supposed species. I even doubt whether there has not been some error in making *E. grandiflora* a native of Ceylon.

157. E. graminea, *Lindl.* l. c. No. 13.
Malacca, *Cuming*; Burma, at Amherst, in woods near the sea, *Griffith*; plains of Behar, *J. D. H. & T. T.* (221).

This must no longer be regarded as a Malay plant, the specimens from Behar differing in nothing except the flowers being rather smaller, with the lip less deeply 3-lobed.

158. E. inconspicua, *Griffith, Not.* iii. 349. t. 326.

This Malacca plant I have not seen. It seems to differ from the last in little beyond the processes on the labellum.

159. E. BRACHYPETALA; foliis oblongo-lanceolatis, scapi vaginis 2 longis membranaceis, racemo raro secundo, sepalis erectis lineari-lanceolatis, petalis conformibus multo brevioribus, labelli trilobi venis crispulis lobis lateralibus acutis intermedio multo longiore oblongo obtuso, calcare subgloboso.
N.W. Himalaya, Gurwhal at 2000–3000 feet, *T. T.* (216).

I have not seen the pollen-masses of this plant, which might be mistaken for *Ania angustifolia.* It must be re-examined with better materials than I possess. Much like *E. Promensis*, but the lip is different.

160. E. virens, *R. Brown.*
Courtallum, *J. D. H.* (221).

161. E. herbacea, *Lindl.* l. c. (E. albiflora, *Edgeworth*, MSS.)
Himalayas, *Edgeworth, in hb. Bentham.*; Concan, *Law, in hb. Hooker.* (220).

The long green narrow sepals, the much broader and shorter petals, and the fringed veins of the lip are peculiar.

162. E. OCHREATA; foliis oblongis acutis, scapo laxe trivaginato, bracteis linearibus acuminatis ovariis longioribus, racemo cylindraceo, sepalis ovalibus acutis concavis, petalis planis latioribus, labello oblongo serrato venis omnibus fimbriatis, calcare parvo hemisphærico.
Concan, *Law, in hb. Hooker.*; Canara, *Stocks* (71).

A small-flowered species with a rather dense cylindrical raceme 4 or 5 inches long. All the parts of the flower membranous.

163. E. bicolor, *Dalzell, in Hooker's Journ.* iii. 43.
Western Ghauts, *Dalzell, in hb. Stocks.* (23); Concan, *Law, in hb. Hooker.*

Much like *E. herbacea*; but the spike is longer and more slender, and the flowers are not half the size. Moreover the spur is longer, and the middle lobe of the lip obovate with long fringes on the veins.

164. E. campestris, *Lindl.* l. c. (E. ramentacea, *Wight, Ic.* 666.)
Western India, *Jacquemont* (653 *in Herb. Mus. Par.*); plains of Rohilcund, *T. T.* (218).

Both these, especially Jacquemont's plant, are taller and more slender than Wallich's Oude specimens, but do not appear to differ otherwise.

165. E. HEMILEUCA; aphylla, vaginis 4 apice herbaceis, racemis longis laxis subsecundis, sepalis lineari-lanceolatis herbaceis, petalis latioribus planis, labelli trilobi laciniis lateralibus apice rectangulis acutis intermedia concava crispa, ramentis venarum paucis sparsis, calcare brevi conico.

Plains of Rohilcund, *T. T.* (219).

Sepals green, petals white. The lip is very membranous, with a very few scattered ramenta on the veins of the middle lobe. Next *E. campestris.*

166. E. PRATENSIS; aphylla, vaginis caulis 5 acutissimis, racemo laxo multifloro, sepalis petalisque brevioribus oblongis acutis, labello oblato 3-lobo laciniis lateralibus ovatis obtusis intermediæ ovatæ obtusæ subæqualibus venis tribus cristatis, calcare brevi conico obtuso.

Pasture lands in the Deccan, in the cold season, *Stocks* (22 bis. E. virens, *in herb. Hooker.*).

Quite a different plant from *E. virens*, to which Stocks referred it, known at sight by its short oblong sepals, still shorter petals, and obtuse 3-lobed 3-crested lip.

167. E. DENSIFLORA; aphylla, vaginis pluribus obtusis, racemo denso, bracteis inferioribus herbaceis ovario longioribus, sepalis petalisque lineari-lanceolatis his brevioribus, labelli trilobi calcare conico lobis lateralibus rotundatis intermedio ovato crispo, venis tribus fimbriatis, ovario calcaris longitudine.

Bootan, *Griffith.*

I have this by favour of the East India Company, through the good offices of Dr. Royle. It is much larger in all its parts than any other of the aphyllous section. The ovary is not at all longer than the spur.

168. E. ramentacea, *Lindl.* l. c. (not *Wight*).

Bootan, *Griffith.*

169. E. rupestris, *Lindl.* l. c.

N. W. Himalayas, *Royle, Jacquemont, Herb. Mus. Par.* (53, 47).

170. E. HASTATA; aphylla, racemis gracilibus densis multifloris, bracteis setaceis ovario brevioribus, sepalis petalisque linearibus distantibus acuminatis, labello unguiculato hastato trilobo acuminato lamellis 2 altis integris supra unguem ortis ad sinus evanescentibus, calcare brevi oblongo.

Assam, *Griffith.*

The flowers are smaller than in any other of the aphyllous species. The nearly hastate lip, the side lobes curving forwards, and the two deep lamellæ beginning above the unguis and vanishing into mere lines opposite the re-entering angles, are unlike anything else in the genus.

171. E. STENOPETALA; aphylla, scapo gracili 3–4-vaginato, racemo brevi, bracteis ovatis acuminatis incurvis ovario longioribus, sepalis secundis petalisque porrectis linearibus æqualibus, labello infundibulari: limbi trilobi lobis lateralibus rectangulis intermedio subrotundo crispo ramentis 3 parvis fissis sinubus oppositis, calcare elongato apice inflato, foliis hysteranthiis gramineis.

Bootan; Panukka on dry hills, *Griffith* (847, *Itinerary Notes*, p. 164).

Authentic specimens, sent me by Griffith himself, show this to be a slender plant, with a graceful scape 18 inches high, terminated by from 5 to 8 flowers, with large herbaceous bracts ending in fine points. According to Griffith's Itinerary, the flowers are purplish with darker veins; at least such seems to have been written by that lamented botanist, as far as can be judged from the wretched state of the printed text.

CORALLORHIZA, *Haller*.

172. C. INDICA: floribus subglobosis, sepalis petalisque oblongis æqualibus secundis obtusis, labello unguiculato concavo reflexo lamina subrotundo-quadrata utrinque medio unidentata intus nuda.

N. W. Himalaya; upper part of Hattee? *T. T.* (no number).

A solitary specimen, found by Dr. Thomson, is before me. It has no root, a stout scape a foot high with two distant close-pressed sheaths, a loose spike of 7 flowers, with linear acuminate spreading bracts, the lower of which are empty. The flowers are about ¾ inch in diameter. The only flower I have been able to dissect had lost anther and pollen-masses; but I think the plant must belong to the present genus.

The leafy Corallorhizas formerly published by me I have now had better means of examining. *C. foliosa* I have redissected; and a second species, from Dr. Thomson, has proved to be in a good examinable state. In both, the pollen-masses are globular, not at all compressed, and in the latter I have found them attached to a true caudicle with its gland. It is therefore clear that they must be separated from Corallorhiza and placed near Eulophia, from which their pollen-masses distinguish them. A third species is the Siberian *Corallorhiza patens*. The alpine habits of all lead me to propose the name of *Oreorchis* for this small group.

OREORCHIS, gen. nov.

Tuberosa. *Folia* angusta radicalia plicata. *Scapi* simplices distantes vaginati, apice dense racemosi. *Sepala et petala* subæqualia secunda, lateralia basi obliqua. *Labellum* unguiculatum

cum columna continuum tripartitum membranaceum intus bicarinatum. *Columna* elongata marginata, stigmate excavato. *Pollinia* 4, globosa, disjuncta, caudicula lineari, glandula carnosa.

173. O. FOLIOSA; sepalis petalisque oblongo-linearibus, labelli lobis lateralibus ovatis obtusis medianis, carinulis parallelis membranaceis.—Corallorhiza with leaves, *Lindl. in Royle's Botany of the Himalayas*, p. 362.

Mussooree, *Royle*; Lachen in Sikkim, at 11,000–12,000 feet, *J. D. H.* (213), rare.

Sepals red; labellum white dabbled with red. Tuber roundish, the size of sparrow's egg. Leaves from 5 to 15 inches long. Flowers small, somewhat secund. In my sketch of Dr. Royle's plant the lip has two distinct parallel carinulæ terminating opposite the re-entering angles of the lip: in the only imperfect flower from Sikkim which it has been possible to dissect, the carinulæ are short, broad, and acute; yet the plants are indubitably the same.

174. O. MICRANTHA; tubere foliis scapoque præcedentis, labelli lobis lateralibus filiformibus basilaribus intermedio apice lunato crispo basi appendice cochleari carnosa instructo.

N. W. Himalayas, 8000–10,000 feet; Yaklul Mountain, Kumaon, *T. T.* (214).

Habit exactly that of the last. Flowers not a quarter the size; petals broader than the sepals. Pollen-masses 4, globular, perfectly distinct, on the end of a spathulate caudicle, connected with an oblong fleshy gland. Capsules pendulous, oval, mucronate, not dehiscent in the plant before me.

175. O. PATENS; tuberibus ovatis monophyllis in rhizoma approximatis, folio (latiore), scapi vagina in medio lineari herbacea patente, labelli lobis lateralibus linearibus supra basin enatis carinulis 2 clavatis distantibus.—Corallorhiza patens, *Lindl. Gen. & Sp.* 535.

Siberia, *Prescott*.

Flowers intermediate in size between the two preceding; lateral lobes of the lip springing neither from the base nor above the middle, but below the middle.

CYMBIDIUM, *Swz.*

176. C. aloifolium, *Swartz*; *Wight, Ic.* 1687??

Nilgherries, *J. D. H.* (234); Sikkim, 1000–3000 feet, *J. D. H.* (228).

The racemes in the Sikkim plant are short, the flowers are rather more fleshy, and the lip shorter than in the southern form. There is however a drawing in Cathcart's collection representing

a plant with leaves 2 feet long, 1¾ broad, and a raceme almost as dense as in *C. elegans.* Wight's figure resembles *C. pendulum*; but that does not seem to be a continental species. *C. erectum* (Wight, Ic. 1753) is very near this; I have not seen it.

177. C. cyperifolium, *Wallich, Cat.* No. 7353. (Cymbidium viridiflorum, *Griff. Itin. Notes*, p. 126, No. 454.)
Khasija, *J. D. H. & T. T.* (267); Bootan, *Griffith.*

The long leaves of this resemble those of some Carex; its long linear-lanceolate bracts far overtopping the flowers; and the linear distant straight lamellæ are quite peculiar.

178. C. COCHLEARE; foliis longissimis angustissimis caricinis, racemo debili multifloro, bracteis obsoletis, sepalis petalisque linearibus acuminatis, labello angusto versus apicem dilatato trilobo lamellis in cochlear semiliberum apice confluentibus.
Sikkim, in hot valleys, *J. D. H.* (235).

The habit is that of *C. cyperifolium*; but the bracts are almost obsolete, the very narrow sepals, petals, lip, and column are full 2 inches long, and the lamellæ of the perfectly bald lip are united into a spoon-shaped process attached by its middle. The form of the end of the lip is unknown to me.

179. C. eburneum, *Lindl. in Bot. Reg.* 1847, t. 67. (C. syringodorum, *Griff. Not.* iii. 338.)
Khasija mountains, Myrung, *Griffith.*

180. C. affine, *Griffith, Not.* iii. 336, t. 291.
Khasija hills, Surureem, *Griffith.*

It is impossible to reconcile the statements made for Griffith by his editor, without assuming that some confusion of papers has taken place. This plant, which I have from himself with his own name, is evidently that to which the second description of his *C. densiflorum* applies, and has nothing to do with the first description, which applies either to a variety of *C. elegans*, or to something very near it. The hairy middle lobe of the lip assists in distinguishing this from *C. elegans*, to which it approaches.

181. C. elegans, *Lindl. Gen. & Sp. Orch.* 163, No. 9, *Sertum Orchidaceum*, t. 14. (Cyperorchis elegans, *Blume, Mus. Lugd. Bot.* i. 48. C. densiflorum, *Griffith, Not.* iii. 337, so far as the first description goes.)
Khasija hills, 5000–6000 feet, *J. D. H. & T. T.* (231); Myrung, *Griffith*; Darjeeling, *Id.*; Sikkim, *Cathcart*, 5000–8000 feet, *J. D. H.* (232).

This species varies greatly in the number of orange-yellow flowers collected in its great oblong nodding racemes. In all states it is to be known by the connivent sepals and petals, and probably also by the presence of a pair of teeth near the base of the two contiguous parallel lamellæ. I must however observe, that I cannot find the latter in my specimens of *C. densiflorum*, from Griffith, although he describes them as being present.

182. C. longifolium, *D. Don*; *Lindl.*, l. c.
Sikkim, *Cathcart*; Khasija, *J. D. H. & T. T.* (230).

Flowers appear, from Cathcart's figure, to be olive-brown, with a white lip spotted with crimson. The lip is covered with down in the inside, and the appearance of the species is that of a small *C. giganteum.*

183. C. giganteum, *Wall. Cat.* No. 7355; *Bot. Mag.* 4844.
Khasija, Nunklow on trees, *Griffith*; Darjeeling, *Id.*; Sikkim, 5000–7000 feet, *J. D. H.* (227, 233).

Varies much in the size and colour of the flowers and the breadth of the leaves. Among Cathcart's drawings, one represents them as dull red on a greenish ground, with the inside of the lip streaked with red, the whole flower being about 3 inches in diameter; another, on the contrary, represents them as nearly 5 inches in diameter, with deep bright-green whole-coloured sepals and petals, and a yellowish lip, the inside of which is profusely dotted with crimson.

184. C. MICROMESON; foliis linearibus loratis basi canaliculatis rigidis racemo erecto paucifloro longioribus, perianthio membranaceo patente, labello cuneato glaberrimo basi conspicue saccato laciniis lateralibus rotundatis intermedia unguiculata oblata biloba apiculata multo minore lamellas 2 filiformes crenulatas emittente versus medium labellum evanescentes.
Khasija, *Griffith.*

For this curious species I am indebted to the East India Company, by whom it was communicated with many other of Griffith's plants, through my friend Dr. Royle. The great bag formed between the bases of the column, lip, and lateral sepals, the long lip smooth, wedge-shaped, with a very small double purple middle lobe, from which run down two smooth crenated lamellæ, disappearing before they reach the middle of the lip, are like nothing else in this genus.

185. C. chloranthum, *Lindl. in Bot. Reg.* 1843, *Misc.* 102. (C. variciferum, *Rchb. f. in Bonplandia*, Oct. 15, 1856.)

This is not among the collections before me. I learn from Prof. Reichenbach himself that his name has to be cancelled.

186. C. sinense, *Willd.*
Khasija, at 1500 feet, *J. D. H. & T. T.* (226).

This does not seem to differ from the Chinese plant.

187. C. ERYTHRÆUM; foliis angustis acutis racemis multifloris brevioribus, bracteis minutis, sepalis lanceolatis, petalis angustioribus patentissimis falcatis, labello convoluto intus tomentoso apice æqualiter trilobo laciniis rotundatis recurvis lateralibus planis intermedia crispa lamellis contiguis rectilineis pilosis apice confluentibus.
Sikkim, in hot valleys, *J. D. H.* (229).

"Panicle varies in length and density, flowers in size and colour. Upper and back part of column grows over stigma, and whole column very much incrassated." *J. D. H.*—From the sketches of Dr. Hooker I learn that the sepals of this fine species are spreading, oblong-lanceolate, green with dull-red broken streaks; the petals somewhat narrower, rose-coloured, and curved backwards; the lip yellow, with numerous red streaks on the outside and inside. In the dried flowers the sepals are two inches long.

188. C. lancifolium, *Hooker, Exot. Fl.* t. 51. (C. Gibsoni, *Paxton, Fl. Garden,* No. 618, *Ic. Xyl.* 301?—C. javanicum, *Blume, Bijdr.* 380.)
Khasija, at 4000–5000 feet, *J. D. H. & T. T.* (139); Mishmee hills, lower ranges, *Griffith*; Sikkim, *Cathcart*; Java, *T. Lobb* (187), *Reinwardt* ("C. vaginatum").

This plant has not appeared among the Hindostan collections, but it seems to be common in the North-eastern Provinces, its track then bending downwards into the Indian Archipelago. That it exists in Java is shown by the specimens above-mentioned from T. Lobb and Reinwardt. Of the only other two Javanese Cymbids that I have seen, one is a grassy-leaved plant allied to *C. ensifolium*, the other is possibly Prof. Blume's *C. cuspidatum*; but nothing certain can be said without examining authentic specimens. *C. Gibsoni* is only a half-monstrous state of this.

CREMASTRA, *Lindl. Gen. & Sp.* p. 172.

189. C. Wallichiana, *Id.* l. c.
Sikkim, at 7000 feet, *J. D. H.* (242).

Blume's figure of the Japanese *Hyacinthorchis variabilis* (Mus. Lugd. Bot. i. t. 16) differs in no respect whatever from the Indian plant, except in having a short shrivelled appendage of the lip instead of a long cucullate one. If this is really so, the species would seem to be distinct; if not, not.

Cyrtopera, *Lindl.*

190. C. bicarinata, *Lindl. Gen. & Sp. Orch.* 189.

Griffith's *Cymbidium*, Not. iii. 343, No. 9, is certainly this, and it is to that description, not to No. 8, that his figure 319 belongs. The description of No. 8 has nothing to do with any species of Cymbidium, Eulophia, or Cyrtopera.

191. C. candida; foliis oblongis acutis petiolo æqualibus, bracteis subulatis ovario æqualibus, sepalis lineari-lanceolatis, petalis oblongis apiculatis brevioribus duplo latioribus, labelli trilobi lobis lateralibus ovatis obtusis intermedio subrotundo crispo apiculato recurvo multo brevioribus tuberculis 2 rotundis versus basin venisque 3 majoribus carnosis elevatis.

Sikkim, *Cathcart, J. D. H.* (241).

Corm orbicular, covered with coarse shreds. Flowers rather before the leaves, greenish white, except the sepals, which are herbaceous. The base of the column is saccate, but the lip is merely concave. Anther fleshy, triangular, stained with crimson. In a dried state it is much like *C. tricarinata*.

192. C. fusca, *Wight, Ic.* t. 1690.

Nilgherries, *J. D. H.* (215).

Wight's figure is a good one, except that the lower half of the veins on the lip is represented as scabrous, like the upper half, while in reality it is perfectly smooth.

193. C. flava, *Lindl.* l. c. = C. Cullenii, *Wight, Ic.* 1754, no doubt.

194. C. ensiformis. (Eulophia exaltata, *Rchb. f. in Bonplandia,* Feb. 15, 1857.)

Philippines, *Cuming.*

An authentic specimen, though but a single flower, from Prof. Reichenbach, enables me to identify his *E. exaltata*, which is certainly a genuine Cyrtopera. I am unable to find on the lip the elevated keels which my learned friend describes. What I find is a somewhat fleshy middle lobe, hollowed out like a spoon, and compressed between the lateral lobes. This being smaller than some other Cyrtoperas, I am obliged to change the specific name: that of *ensiformis* indicates one main feature of the species whose leaves are as long, straight, and narrow as any Iris or Gladiolus.

195. C. squalida, *Rchb. in Bonpl.* Feb. 15, 1857. (Eulophia squalida, *Lindl. in Bot. Reg.* 1841, *Misc.* 164.)

Philippines, *Cuming*; Borneo, *T. Lobb.*

I assent to the removal of this from Eulophia, although the short spur may almost as well be referred to the labellum as to the column.

196. C. MYSORENSIS; foliis oblongis petiolo longioribus, bracteis subulatis ovario æqualibus, sepalis lineari-lanceolatis carinatis apiculatis, petalis planis minoribus? labello oblongo indiviso crispo apiculato intus nudo.

Mysore, *Law in hb. Stocks.* (56).

A plant with the habit of *C. fusca*, but widely different in the structure of the lip. Owing to the bad state of my specimen, I am uncertain whether the petals are really much shorter than the sepals, or not.

197. C. SANGUINEA; aphylla, discolor, tubere crasso oblongo articulato, scapo trivaginato, bracteis lineari-lanceolatis ovario longioribus, sepalis oblongo-lanceolatis, petalis ovatis brevioribus, labello obsolete trilobo apice rotundato recurvo, anthera mucronata.

Sikkim, *Cathcart*; at 4000–5000 feet, *J. D. H.* (223 & 361).

Plant from 1 foot to more than 2 feet high, of one uniform dull-greenish crimson tint, except the lip, which is rose-colour. The petals are not much more than ⅔rds the length of the very acute sepals, which are rather more than 1 inch long. The inside of the lip is free from lamellæ or other processes, but is obscurely papillose on all the veins.

There is a Cyrtopera from Sumatra with dense pyramidal racemes of dull-purple flowers among Professor DeVriese's drawings, where it is called *Cymbidium geophilum*; but I have seen no specimen. It seems to be different from this.

SACCOLABIUM, *Blume.*

198. S. guttatum, *Lindl. Gen. & Sp. Orch.* 220.

Chittagong, *Col. Fielding*; Kamaon, in the Simai valley, *J. D. H.* (185); Sikkim, in hot valleys, *Id.* (184).

It may be doubted whether either *Saccolabium Blumei* (which is *S. Rheedii* of Wight's Ic.), or *S. macrostachyum* (Sertum, Orch. t. 47), are distinct from this common species, notwithstanding the difference in the form of the middle lobe of their lip and some other circumstances. At least I have from Java a plant gathered by Mr. T. Lobb, which combines the præmorse leaves of *S. guttatum* with the short spike and retuse lip of *S. Blumei.*

199. S. GURWALICUM; subacaule, radicibus maximis compressis, foliis canaliculatis distichis truncatis spicis simplicibus longioribus, sepalis petalisque obtusis, labelli calcare late conico rotundato compresso

intus hirto lamina carnosa concava unguiculata subtriloba, fructu ovali brevi trialato ligneo.

Gurwhal, N.W. Himalaya, at 3000 feet of elevation, *T. Thomson* (181); Gunai valley, Kamaon, *Id.* (185).

A very distinct plant, nearly allied to *S. guttatum*. The raceme in my specimen is not more than 3 inches long, and very dense; the lateral sepals are considerably larger than the petals and dorsal sepal. The ripe fruit is not above a quarter the size of that of *S. guttatum*, almost exactly oval, and much harder.

200. S. calceolare, *Lindl.* l. c.; *Griff. Notul.* iii. 356. t. 334. (Vanda pulchella, *Wight, Ic.* t. 1671.)

Base of Khasija, *J. D. H. & T. T.* (187); Sikkim, in hot valleys, *Id.* (187), *Cathcart*; Java, *T. Lobb.* (339.)

A most variable plant, constant in little except the extremely acuminate unequal-sided points of the leaves. The middle lobe of the lip is sometimes a mere ciliated rim, sometimes a deep triangular fringed plate, and occasionally quite entire. The leaves vary in breadth from ⅕th of an inch, as in Griffith's figure, to ⅘ths, as in Hooker's Khasija specimens. The Java plant has the leaves less unequal at the end, and acuminate, and appears to be smaller than the Indian forms, one of my specimens not being more than ¼ inch high. In all cases the flowers would seem to be spotted, with the sepals and petals fleshy and oblong.

201. S. obliquum, *Lindl.* l. c.

Khasija, *J. D. H. & T. T.* (189).

A careful examination of flowers in spirits does not enable me to point out any important distinction between this and *S. calceolare*; so that the broad leaves with very blunt ends afford the only available specific character. Dr. Hooker writes on his label, "flowers exactly as in 188 (*S. calceolare*), but larger and whiter." The sepals and petals appear to be also narrower.

202. S. intermedium, *Griff.* MSS. (Sacc. no. 4, *Griff. Not.* iii. 357).

Khasija hills: Moosmai, Oct. 1835, *Griffith.*

I have this from the author. It is much like *S. calceolare*, but is more caulescent and more fleshy, with scarcely any appearance of a second lobe on the thin extremely acuminate end. The flowers are not half the size, with much narrower sepals and petals. The lip is, moreover, almost exactly hemispherical. It seems distinct.

203. S. acutifolium, *Lindl.* l. c. (S. denticulatum, *Paxton, Mag. Bot.* vii. 145; *Bot. Mag.* t. 4772.—Saccolabium, *Griff. Itin. Not.* p. 46, no. 713; *Notul.* iii. t. 333.)

Sikkim, *Cathcart*; at 5000 feet, *J. D. H.* (367); Khasija, *Griffith.*

This has numerous flowers on long stalks at the end of a stout peduncle; and the very fleshy leaves are convex and acute. It is also quite different from *S. calceolare* in its decidedly caulescent habit. The flowers are whole-coloured, yellowish-brown, unspotted, with the lamina of the lip broad, triangular, and marked with a circular collection of crimson spots in the very disk. Griffith's plant is a narrow-leaved small state, as compared with the Sikkim form, which has twenty flowers at the end of a stout peduncle 2½ inches long. I have seen no specimen; and the Indian drawing, after which the definition in the Gen. & Sp. was prepared, seems to have been misunderstood.

No Indian collection yet examined by me has contained a plant that answers to the account of *S. dasypogon*.

204. S. micranthum, *Lindl.* l. c.
Bootan, *Griffith*; Mergui, *Id.*

205. S niveum, *Lindl*, l. c.
Ceylon, *Thwaites*, in the Hewahette district.

206. S. gemmatum, *Lindl. in Bot. Reg.* 1838, *misc.* 88; *Rchb. fil. in Bonplandia*, Oct. 15, 1856.
Sikkim, at 4000–6000 feet, *J. D. H.* (209); Ceylon, *Gardner, in hb. Hooker.* (872).

This has much the appearance of the last; but the petals are short and obtuse, the leaves much broader, the racemes longer, and the flowers blood-red, except the lamina of the lip, which is white, with the two lateral short lobes greenish, succulent, and resembling oblong glands. The flowers are scentless (*J. D. H.*). I have it from Griffith without locality.

207. S. PACHYGLOSSUM; foliis semiteretibus spicis paniculatis subæqualibus, sepalis carinatis oblongo-linearibus apice secundis, petalis linearibus, labelli calcare oblongo leviter arcuato limbo carnoso unguiculato apice dilatato plano-subrotundo dorso convexo.
Borneo, *T. Lobb.*

Flowers not half as large as in the two last, which it much resembles. Sepals remarkably fleshy, narrow, with their points recurved, while from between the laterals projects the lamina of the labellum in the form of a minute spoon.

208. S. RAMULOSUM; caulescens ramosum, foliis semiteretibus angustissimis recurvis, floribus (minutis) paniculatis clausis carnosis, sepalis oblongis carinatis, petalis brevioribus retusis, labello apice plano-convexo calcare oblongo.—*Schœnorchis paniculata*, Blume, Bijdr. 362.
Java, *De Vriese.*

This wants the peculiar column of Schœnorchis, and is in no respect distinguishable from Saccolabium. The leaves seem to vary much in size.

209. S. CHIONANTHUM; foliis teretibus recurvis spicis simplicibus æqualibus, floribus (minutis) carnosis, sepalis obtuse carinatis petalisque minoribus apiculatis, labello apice appendice plano-convexa triangulari instructo calcare horizontali oblongo, anthera apice lineari elongata erecta.—*Schœnorchis micrantha,* Blume, *l. c.*
Java, *Reinwardt.*

Like the last, this is quite without the essential character of Schœnorchis. The whole plant is only 4 or 5 inches long, with minute snow-white flowers.

210. S. ampullaceum, *Lindl. in Sert. Orch.* t. 17. (S. rubrum, *Id. Gen. & Sp.* no. 11.—Aerides ampullaceum, *Roxb. Fl. Ind.* iii. 476.)
Sikkim, in hot valleys, *J. D. H.* (196).

The flowers are rather larger than in Wallich's specimens. *S. miniatum* (Bot. Reg. 1848, t. 58) differs in little except colour, varying greatly in the size of its flowers.

211. S. brevifolium, *Lindl.* l. c. no. 27.
Ceylon, *Thwaites* (488.—S. virescens, *Gardner* MSS.), *Gardner* (871).

The form sent from Ceylon by Thwaites appears to be identical with the original plant, except in having the flowers green instead of red.

212. S. gracile, *Lindl.* l. c.
Ceylon, *Gardner* (869); Hautane, *Champion.*

213. S. PALLENS (*Cathcart,* MSS.); caulibus longis pendulis ramosis radicantibus, foliis carnosis loratis oblique obtusis, racemis axillaribus laxis flexuosis foliis brevioribus, sepalis petalisque oblongis æqualibus, calcare cornuto duplo longiore, limbi 3-lobi laciniis parvis subæqualibus lateralibus rotundatis intermedia acuta.
Sikkim, *Cathcart.*

I have seen no specimen of what seems a very distinct and handsome species; the above description is taken from a figure of Mr. Cathcart. The plant is represented as having branches 9 inches long, protruding strong free flexible roots as long or longer than themselves, leaves 8 inches, and loose zigzag racemes 4–5 inches. The flowers are whitish, with a pink line in the middle of each sepal and petal, and on the outside of the long curved spur. It is very near the next species; but the flowers are much larger, and the middle lobe of the lip, instead of being as long as the spur, is merely a triangular point.

214. S. Wightianum, *Lindl.* l. c.; *Wight, Ic.* t. 917. (Aerides radicosum, *A. Rich. in Ann. Sc.* 2 ser. xv. p. 65, t. 1. fig. C.
Courtallum, *Wight* (907); Nilgherries, *Perrottet* (75 *Herb. Mus. Par.*); Khasija, *T. Lobb.*

Like the last, except in the circumstances already mentioned. In my specimen the lip has sharp lateral triangular lobes, and a middle one acute, rather fleshy towards the base, but thin and slightly crenulate above the middle. A. Richard's plant, which came from the neighbourhood of Ootacamund, is certainly to be referred here.

215. S. DISTICHUM; caulibus elongatis filiformibus, foliis lanceolatis setaceo-acuminatis distichis, pedunculis paucifloris terminalibus et axillaribus, sepalis petalisque oblongis carnosissimis, labello calceolari lobo medio semicirculari membranaceo acuto disco didymo carnoso.
Sikkim, 6000–8000 feet, *J. D. H.* (206); Khasija, 5000–6000 feet, *Id.* (83).

A very peculiar species, probably most nearly allied to *S. acutifolium*, and remarkable for its long weak stems and fleshy distichous leaves about an inch long. The middle lobe of the lip is not exterior to the two others, and it has a remarkable glandular convex double disk.

216. S. ringens, *Lindl.* l. c., is S. rubrum, *Wight, Ic.* t. 1673, a good figure, but not the plant of the Genera and Species Orch.

217. S. VIRIDIFLORUM; acaule, foliis (2) oblongis planis obtusis emarginatis, pedunculo laterali bivaginato paucifloro foliis multo breviore, sepalis petalisque unguiculatis obtusis, labello ovali nudo calcare infundibulari incurvo æquali. Micropera viridiflora, *Dalzell, in Hooker's Journal*, iii. 282.
Western India, *Dalzell, in hb. Hooker.*

Very near *Œceoclades pusilla*, but with much shorter spikes, and fleshy, not membranous, flowers. This *Œ. pusilla*, with *flexuosa*, *paniculata* (*Sacc. parvulum*, m.), and perhaps *tenera*, are Saccolabia, while others are certainly *Angræca*; and it is probable that *Œ. maculata* is the only plant to which the generic name will attach.

Note.—The *Sarcanthus roseus*, Wight, Ic. 1685, and *filiformis*, Ic. 1684, are certainly species of this genus, and perhaps not distinct from each other. I have seen no specimens.

Saccolabium papillosum of the same author, Ic. 1672, is not *Acampe papillosa*, nor do I recognize it.

PODOCHILUS, *Blume.*

218. P. densiflorus, *Bl. Rumphia*, iv. p. 43.
Borneo, *T. Lobb.*

219. **P. lucescens,** *Blume, Bijdr.* 295, t. 12.
Borneo, in Sarawak, *T. Lobb.*

The unguiculate labellum, with a pair of appendages at its base, and the absence of all cohesion between the labellum and lateral sepals, are characters at variance with the usual structure of this genus; and yet it is the original typical species.

220. **P. cultratus,** *Lindl. Gen. & Sp.* p. 234.
Sikkim, in hot valleys, *J. D. H.* (1); Assam, *Griffith, Masters.*

It is remarkable that all the specimens examined by me continue to be without flowers.

221. **P. microphyllus,** *Lindl.* l. c.
Khasija, at 3000 feet, *J. D. H.* (84); Penang, *Gaudichaud.*

Blume's *P. scalpellifolius*, which I have not seen, if accurately dissected by his artist, differs in the lip being linear, not broad at the base, and cordate; and in the sepals being almost wholly united, like some species of Tæniophyllum. In general appearance it is undistinguishable from this.

Note.—Blume's *Cryptoglottis serpyllifolia*, which I have from T. Lobb, gathered in Borneo, is only a Podochilus with an excessive development of the lateral sepals into a long spur: the basal processes of the lip are analogous to those of *Podochilus lucescens.*

CAMAROTIS, *Lindl. Gen. & Sp.* p. 219.

222. **C. purpurea,** *Lindl.* l. c. Sertum Orch. t. 19.
E. Bengal, Chittagong, and base of Khasija, *J. D. H. & T. T.* (186).

223. **C. pallida.** (Micropera pallida, *Lindl.* l. c.)

This is not among the collections recently placed in my hands. It is undoubtedly nothing more than a Camarotis.

224. C. PHILIPPINENSIS; folio oblongo oblique obtuso, racemis arcuatis multifloris, sepalis lateralibus liberis labello suppositis, labello subtriangulari saccato-cucullato apice carnoso tridentato incurvo.
Philippines, *Cuming.*

Flowers larger than in either of the former, somewhat triangular in the bud, apparently fleshy. There is no adhesion between the sepals and labellum, as in *C. purpurea* and *pallida*, on which account the generic character requires to be modified; and the same is the case in my *Saccolabium fasciculatum*, as Prof. Reichenbach has suggested, if indeed the leaves and loose flowers of that species really belong to the same plant.

MICROPERA, *Dalzell.*

225. **M. maculata,** *Dalzell, in Hooker's Journal,* iii. 282.

On trees near Tulkut, in the Western Ghauts, in lat. 16° N., *Dalzell, in hb. Stocks.* (25).

I have already stated that my genus Micropera must be reduced to Camarotis. The present plant, which seems not to be referable to any known genus, may as well, however, retain the name. Mr. Dallzell's account of it is good as far as it goes, describing correctly the very curious lip, which looks like a side saddle with two horns instead of one,—the pouch, into which there is an opening only between the horns, being almost concealed by the lamina, which hangs down in the manner of saddle-flaps. The column, which Mr. Dalzell does not mention, falls back, is small, short, semiterete, with a vertical rostellum pointing downwards, and dividing into a pair of broad scissor-like blades. Upon this lies a great oblong gland, to which is attached an obovate channeled membranous caudicula.

N.B. *Micropera viridiflora,* Dalzell, is *Saccolabium viridiflorum,* No. 217.

STEREOCHILUS, n. gen.

Acaulis. *Folia* lorata, apice obliqua. *Racemi* laterales, laxi, flexuosi, pauciflori (hirti). *Sepala* et *petala* subæqualia patentissima, lateralibus labello leviter adnatis. *Labellum* solidum, carnosum, sacciforme, facie superiore concava basi bicorni. *Columna* recta, teres, basi haud producta, rostello horizontali subulato. *Pollinia* 4, oblonga, omnino distincta, caudicula setacea, glandula minutissima.

This genus is near Camarotis, from which it differs in its solid bag-shaped lip with a pair of horns at the base, in its setaceous caudicula, and in the 4 oblong pollen-masses being perfectly distinct from each other.

226. **S. hirtus.**

Khasija, at 5000 feet, *J. D. H. & T. T.* (177).

Leaves narrow, rather more than 4 inches long by $\frac{3}{8}$ths wide. Racemes 7–8-flowered. Flowers less than $\frac{1}{2}$ an inch in diameter, free from the coarse short hairs that clothe the ovary and pedicels.

SCHŒNORCHIS, *Blume.*

227. **S. juncifolia,** *Blume,*

Seems to be the only species, if the genus is characterized by the two long erect filiform processes of the column. Otherwise there is nothing sufficient to distinguish the genus from Saccolabium, to which *Schœnorchis paniculata* and *S. micrantha* certainly belong.

SARCANTHUS, *Lindley*.

228. S. peninsularis, *Dalzell, in Hook. Journ.* iii. 343. (S. pauciflorus, *Wight, Ic.* 1747).

Western India, *Dalzell*; Malabar, on trees, *Jerdon* (*Wight*).

Specimens of this from Dalzell occur in Stocks's Herbarium now at Kew; and I also have it in a very young state from Dr. Wight, whose figure is by no means so good as usual. (Wight's three other Sarcanthi belong to Saccolabium.) Griffith's *Sarcanthus secundus*, Not. iii. 363, t. 336, from Suddyah in the Mishmee hills, seems to be this, which, if so, will no longer be merely a western plant.

229. S. pallidus, *Lindl. Bot. Reg.* 1840, *misc.* 185. (S. tricolor, *Rchb. f. in Bonplandia.*—Saccolabium racemiferum, *Lindl. Gen. & Sp. Orch.* 224, no. 24.)

Khasija, at 4000 feet, *J. D. H. & T. T.* (178), also found in Mr. Raban's garden, E. Nepal, *J. D. H.* (*id.*).

This differs in no respect whatever from the garden plant. Prof. Reichenbach's synonym is derived from a communication from that learned Orchidologist.

COTTONIA, *R. Wight, Ic.* no. 1755.

230. C. macrostachya, *Wight*, l. c. (Vanda peduncularis, *Lindl. Gen. & Sp.* p. 216.)

S. Concan, *Dalzell, in hb. Stocks.* (4).

231. C. Championi, *Lindl. in Hook. Journal*, vii. p. 35.

Khasija, at 3000–4000 feet, *J. D. H. & T. T.* (190).

This seems to be in no respect different from the plant found by Champion on Victoria Peak in Hong Kong, and thus affords another remarkable instance of epiphytal Orchids occurring in stations widely remote, without, as far as we at present know, any intervening locality.

UNCIFERA, gen. nov.

Caulescens. *Folia* disticha, subcarnosa. *Racemi* densi, oppositifolii. *Sepala* libera, erecta, obtuse carinata, æqualia. *Petala* paulo minora, retusa. *Labellum* infundibulare, in calcar retrorsum uncatum vacuum productum, membranaceum leviter trilobum, apice carnosum. *Columna* teres, decurva, apice dilatata, biauris, area stigmatica horizontali prona. *Anthera* apice membranacea, elongata, bidentata. *Caudicula* maxima, cartilaginea deorsum canaliculata supra medium dilatata, apice in falcem obtusam contracta cujus acies labellum respicit. *Pol-*

linia 4, arctissime geminata, æqualia, acici falcis per ligulas 2 elasticas adnata. *Glandula* longissima, cartilaginea, sagittata.

232. U. OBTUSIFOLIA; foliis latis loratis obtusis oblique bilobis, petalis 3-veniis, labelli margine utrinque 1-dentato apice retrorsum bidentato, calcare apice inflato.

Base of Khasija, *J. D. H. & T. T.* (194).

Flowers twice as large as in the following.

233. U. ACUMINATA; foliis lanceolatis oblique acuminatis obtusis petalorum venis 3 cis apicem evanescentibus, labelli 3-lobi lobis lateralibus rotundatis intermedio brevi tereti carnoso obtuso, calcare acuminato.

Assam and Khasija, *Griffith*; base of Khasija, *J. D. H. & T. T.* (193).

Flowers much smaller than in the last. Spur of lip tapering to the point. Petals 3-veined, as in *U. obtusifolia*; but the veins stop short of the blunt end, instead of running out.

Of this very curious genus the two species exactly agree in their column and its parts, although so different in the details of the petals and lip. I know of no parallel to the terete column, bent down till the stigma is brought into a horizonal position, looking down as it were into the spur; or to the singular caudicle, which after expanding laterally from its narrow point, and bending down its sides so as to form an arch over the anther-bed, which is here the apparent back of the column, suddenly contracts into a process like a billhook, the edge of which faces the front and bears the pollen-masses. The abruptly hooked lip, which has suggested the name, is itself unlike anything among Indian Orchids.

ANGRÆCUM, *Thouars*.

The only Indian species that I have seen of this African genus is the following:—

234. A. ZEYLANICUM; subacaule, foliis lanceolato-loratis lobo altero apicis elongato subfalcato, racemis filiformibus paucifloris duplo longioribus, sepalis petalisque acuminatis æqualibus, labello cochleato acuminato calcare horizontali clavato.

Ceylon, at Narawelle, *Champion*.

Very like *A. caulescens*; but the leaves are broad, 10 inches long, with one of the terminal lobes much longer than the other, and the spur not inflated at the point. I have not seen the column in an examinable state.

AERIDES, *Loureiro*.

235. A. Wightianum, *Lindl. Gen. & Sp.* p. 238. (A. testaceum, *Id.* —Vanda parviflora, *Lindl. in Bot. Reg.* 1844, *misc.* 57.)

Ceylon, Tangalle, *Champion*; Concan, *Law, in hb. Hooker*. (183).

236. A. cylindricum, *Lindl.* l. c.; *Wight, Ic.* 1744; *Bot. Mag.* 4982.
Nilgherries, *J. D. H.* (210); Sikkim, at 5000 feet, *Id.* (210).

237. A. tæniale, *Lindl.* l. c. (Acrides carnosum, *Griff. Not.* t. 338 A.)
Bootan, *Griffith*; Khasija mountains, up to 3000 feet, *J. D. H. & T. T.* (191).

"Flowers pale lilac," *J. D. H.* In the Khasija specimens the leaves are from 4 to 5 inches long, and 1 to 1½ inch broad.

238. A. affine, *Wallich, Cat.* no. 7316; *Sertum Orch.* t. 15; *Bot. Mag.* t. 4049, bad. (A. roseum, *Loddiges*; *Paxton, Fl. Gard.* t. 60.—A. trigonum, *Klotzsch, fide Rchb. f.*)
Plains of E. Bengal and Assam, *J. D. H. & T. T.* (185); Assam and Bootan, *Griffith.*

Among the many specimens I have seen, flowers have occurred in drooping and upright racemes, deep crimson and pale rose, with the lip and other parts acute or obtuse, all which are therefore marks of one and the same variable species.

239. A. odoratum, *Loureiro.*
Base of Khasija, up to 2000 feet, *J. D. H. & T. T.* (182); Garden of Saharunpore, *Id.*; Sikkim, in low valleys, *J. D. H.*

240. A. crispum, *Lindl. Gen. & Sp. Orch.* p. 239; *Bot. Reg.* 1842, t. 55; *Bot. Mag.* t. 4427. (A. Brookei, *Bateman, in B. R.* 1841, *misc.* 116.—Saccolabium speciosum, *Wight, Ic.* t. 1674.)
Concan, *Law, in hb. Hooker.* (268); *Dalzell, in hb. Stocks.* (75).

Several varieties of this beautiful plant are in our gardens. The flowers in *A. Brookei* are rather smaller than usual.

241. A. Lindleyanum, *Wight, Ic.* t. 1677.
"On clefts of rocks bordering the Kartairy falls below Kaitie; also on rocky clefts on a high hill over Coonoor, flowering nearly the whole year," *R. Wight*; Nilgherries, *T. T.* (208).

One of the finest of its order, the flowers being larger than in either *A. crispum* or *falcatum*, and in larger more branching panicles. For this reason the localities given by Wight are stated exactly, in the hope that some collector may send it home. In front of the opening into the spur stands a pair of large curved tubercles, which have not been observed in *A. crispum.*

242. A. difforme, *Wallich, in Lindl. Gen. & Sp.* 242.
Khasija, at 3000–4000 feet, *J. D. H. & T. T.* (204), *Griffith.*

This, which is the plant that Wallich had before him, seems to differ from the following in having smaller flowers, with the middle lobe of the lip only 2-lobed, the basal ones longer and a little undulated, and the leaves more tapering to the base. This I learn in part from careful dissection, and in part from one of

Dr. Hooker's admirable sketches. The Sikkim plant may therefore be defined thus:—

243. A. HYSTRIX; foliis oblongis, petalis linearibus, labelli lobis lateralibus planis intermedio trilobo fimbriato apice recurvo brevioribus.

Sikkim, at 4000–5000 feet elevation, *J. D. H.* (204).

The flowers are yellow with crimson streaks along the sepals and petals; the middle lobe of the lip, which is deeply fringed and crimson, consists of two lateral lobes diverging at the base, and converging upwards over a circular recurved middle lobe.

244. A. decumbens, *Griff. Not.* iii. t. 320, a Burmese plant, seems to be a true Aerides; but I have seen no specimen.

VANDA, *R. Brown.*

To the species described in '*Folia orchidacea*,' the following fine addition to the section FIELDIA has to be added:—

245. V. UNDULATA; foliis distichis obtusis bilobis pedunculo apice paucifloro triplo brevioribus, sepalis petalisque recurvis membranaceis lineari-lanceolatis undulatis, labello breviore carnoso cochleato in laminam linearem acutam sub apice tuberculatam producto.

Sikkim, *Cathcart, Ic.*

The whole habit is that of *V. spathulata* and *cærulescens*. The flowers are fully two inches in diameter, with thin white sepals and petals tinged with pink, and a yellow fleshy lip fasciated internally with red lines. I have only seen a drawing prepared by Mr. Cathcart's artists.

TÆNIOPHYLLUM, *Blume.*

246. T. ALWISII; minutissimum, spica pauciflora erecta, bracteis carinatis triangulis, perianthii laciniis omnibus connatis acutis conformibus, calcare hemisphærico, polliniis pyriformibus in glandulam sessilibus.

On the branch of a Symplocos, Ceylon, *De Alwiz.*

The smallest Orchid I know, the flat roots not being more than 1½ inch long, and the stem, including flowers, ¼ inch. The whole plant is pale green, even the flowers having no other colour. Mr. Thwaites, who sent me a drawing of it (and I have seen nothing more), proposed to call it *Alwisia minuta*, after his excellent native draughtsman, who was the first to discover it; and if the figures in Blume and the Xenia represent the invariable characters of Tæniophyllum, this and *Dendrobium algosum* of Reinwardt's MSS. ought to be distinguished; but Prof. Reichenbach, jun., who has had the opportunity of examining Tæniophylla, assures me that this is one, and I possess no materials on which to form an opinion for myself.

CHILOSCHISTA, *Lindl. Gen. & Sp.* p. 219.

247. C. usneoides, *Id.*; *Wight, Ic.* 1741.
Sikkim, at 4000 feet, *J. D. H.* (192).

According to Cathcart's drawings, the caudicula is short and broad, with a large semicircular gland, not subulate with a minute gland, as represented by both Wallich's and Wight's artists. The plant seems to be constantly leafless.

ACERAS, *R. Br.*

248. A. angustifolia, *Lindl. Gen. & Sp. Orch.* p. 282.
Khasija, 5000–6000 feet, *J. D. H. & T. T.* (280); N.W. Himalaya, 5000–8000 feet, *T. T.*; Sikkim, in hot valleys, *J. D. H.*

Flowers green, in a very long slender spike.

HERMINIUM, *R. Br.*

249. H. monorchis, *Id.*
N.W. Himalaya, 8000–12,000 feet, *T. T.* (263); Nutra, W. Thibet, 11,000 feet, *Id.*

250. H. congestum, *Lindl. Gen. & Sp. Orch.* p. 305. (H. unalaschkense, *Rchb. f. Orch. Fl. Germ.* p. 107, t. 65, excluding the syn. of Platanthera Schischmareffiana.)
Sikkim, 11,000–12,000 feet, *J. D. H.* (265).

Differs from *H. monorchis* in its erect blunt obovate-lanceolate leaves and entire lip.

SATYRIUM, *Swartz.*

The first knowledge we had of the existence in India of this African genus was derived from the collections of Buchanan Hamilton, from which, in the year 1824, David Don published his *Satyrium nepalense*. In 1838 I became aware of the existence of two others, and described them under the names of *S. Wightianum* and *ciliatum*. Three years later Achille Richard described three others from the Nilgherry collections of Perrottet,—*Perrottetianum*, *albiflorum*, and *pallidum*. Authentic specimens of all these are before me, together with a considerable number from various parts of India, among which is a fine series from Drs. Hooker and Thomson. These materials show, not only that the genus Satyrium abounds in individuals, but that it is subject to very great differences of stature, foliage, and inflorescence. I think, however, the three species admitted in 1838 are to be distinctly recognized; but the Nilgherry plants of Achille Richard are not distinguishable from *S. nepalense*, not even his *S. pallidum*, said to have yellow flowers, which is probably a mistake.

The original *S. nepalense* is distinctly known by its somewhat lax inflorescence, large coloured bracts, and spurs as long as the ovary, or longer. The two others have very short spurs. Of these, *S. ciliatum* has a thin inflorescence like that of *S. nepalense* itself; *S. Wightianum* has a very dense inflorescence; both are much dwarfer than *S. nepalense*. The specimens under my examination may be arranged thus:—

251. S. Nepalense. *D. Don, Prodr. Fl. Nep.* 26; *Wight, Ic.* 929. (S. Perrottetianum, *Ach. Rich. Ann. Sc.* ser. 2. xv. 76; *Wight, Ic.* 1716. —S. albiflorum, *A. Rich.* l. c.; *Wight, Ic.* 1717. S. pallidum, *A. Rich.* l. c.).

Sikkim, 7000-12,000 feet, stout, like Gymnadenia, *J. D. H.* (259); Ceylon, *Macrae* (9); Nilgherries, *Wight*, *Perrottet* (193, *hb. Mus. Par.*); Mysore, *Stocks* (53); Khasija, *Griffith*, *Lobb*, 4000-6000 feet, *J. D. H. & T. T.* (259); N. W. Himalayas, *T. T.*

S. Perrottetianum is merely a gigantic state of the species, while *S. pallidum* is its starved form; not, however, the most so, for the old specimens sent from Nepal by Wallich among his earliest collections are still more attenuated.

252. S. Wightianum, *Lindl. Gen. & Sp. Orch.* p. 340; *Wight, Ic.* 1718. Nilgherries, *Perrottet* (191 & 850 *in hb. Mus. Par.*), *Wight*; Khasija, *Lobb.*

A much dwarfer plant than the preceding, with two broad radical leaves suddenly changing to about two great inflated herbaceous sheaths, and an extremely dense blunt spike. Flowers "rubri aut coccinei" according to Perrottet, pink according to Wight, and smaller than in *S. nepalense*.

253. S. ciliatum, *Lindl.* l. c.

Sikkim, 7000-12,000 feet, *J. D. H.* (259); Bootan, grassy sward above Tongsa, 10,000 feet, *Griffith.*

The very short spurs of this are so different from the long attenuated ones of *S. nepalense*, that I think it must be distinct. Moreover it is a smaller plant with 2-3 spreading herbaceous distant sheaths, but little inflated. In the original specimen the bracts are large and herbaceous, in those from Bootan much smaller and deflexed, the plant varying like *S. nepalense* in that respect.

DIPLOMERIS, *D. Don.*

254. D. pulchella, *Id.*

Khasija, *Griffith*, 2000-4000 feet, *J. D. H. & T. T.* (256).

Flowers pale straw-colour or nearly white, variable in size. Spur green.

Pogonia, *Jussieu.*

255. P. flabelliformis, *Lindl. Gen. & Sp. Orch.* 415.
Concan, *Law, in hb. Hooker.* (350); near Dharwar, *Stocks, in hb. Hooker.* (68); Mysore, *Id.* (54).

It is probable that Blume's *Rophostemon concolor* should be referred to this species.

256. P. carinata, *Lindl.* l. c.; *Wight, Ic.* t. 1720. (Pogonia 2, *Griffith, Notul.* iii. 377, *Ic.* 345.)

I have never seen this plant, which appears to be perfectly distinguished by its stout habit, very large tubers, and lip acute and shaggy within, instead of being nearly naked and rounded at the point. Griffith's Pogonia No. 2 is evidently the same; of his Pogonia No. 1, which seems to be near *P. Juliana*, but distinct, I have seen no specimen.

Eria, *Lindley, in Bot. Reg.* 904.

This genus, like Dendrobium, consists of species extremely dissimilar in habit, and must now receive several supposed genera, created by different authors before the limits could be definitely settled. These are *Conchidium* and *Xiphosium* of Griffith, *Tylostylis*, *Mycaranthes*, *Cylindrolobus*, and *Trichotosia* of Blume, and my own *Bryobium* and *Trichosma*. But although no longer admissible as genera, the species collected under these names are for the most part convenient sections.

The careful study of a very large quantity of materials leads me to propose the following classification. In the first place, the species of Griffith's Conchidium, analogous to the small Stachyobia in Dendrobium, are readily known by their thin leaves, almost stemless habit, and smooth flowers; such stem as they form is merely a depressed pseudobulb covered by the bases of the leaves. Then follow the species with true fleshy pseudobulbs and nothing more, separable into large-flowered woolly species (Dendrolirium), large-flowered naked species (Xiphosium), large-flowered woolly species with an unguiculate flat roundish lip (Tylostylis), and small-flowered woolly species (Mycaranthes), in which the fleshy pseudobulb is sometimes exchanged for a slender cylindrical stem like that of Trichosma. Next to these stands Trichosma itself, with its long slender 2-leaved stems, large smooth flowers, and fleshy anther. Another group, Hymeneria, includes the species with thin sepals and petals, which are usually naked, and short fleshy stems having a few leaves towards the top. The remainder are truly caulescent; among these, four well-marked subdivisions may be formed: viz. ERIURA, remarkable for a tuft or two of wool on the axis of the lip, TRICHOTOSIA with coarse shaggy racemes, CYLINDROLOBUS, with 1- or 2-flowered peduncles clothed with smooth coloured membranous bracts below the flowers, and finally UROSTACHYA, which includes the species that will go into none of the preceding sections.

§ I. CONCHIDIUM, *Griffith.*

This group bears the closest analogy to the second section of Stachyobium among Dendrobia, like it, consisting of small stemless species, with round or depressed pseudo-bulbs, membranous leaves, and flowers solitary or in few-flowered racemes, for the most part very minute. To this last, however, *E. braccata* and *Lichenora* are exceptions. In *E. pusilla*, *microchilos*, and others, four of the pollen-masses are rudimentary and easily overlooked: in *muscicola* and *microchilos*, indeed, I have only succeeded in finding four; but their form, tapering downwards into a point, seems to be a safe mark to separate them from the minute Dendrobia.

257. E. braccata. (Dendrobium braccatum, *L. O.* p. 75.—Eria reticosa, *Wight, Ic.* 1637.—Eria uniflora, *Dalzell in Hooker's Journal*, iv. 111.)
Ceylon, *Macrae*, *Gardner* (859), *Thwaites* (2356); Horton plains, *Champion* (Eria velifera, *R. W.*); Nilgherries, *Wight*; common on trees in the Western Ghauts, in the rainy season, *Stocks* (24).

When this was first published I had been unable to examine the pollen-masses. It varies in the size of the flowers; those from the Western Ghauts, preserved among Stocks's plants, are four times as large as the Cingalese, with much more acuminate sepals and petals.

258. E. Lichenora. (Lichenora Jerdoniana, *Wight, Ic.* 1738.)
Malabar mountains, *Wight*.

This remarkable plant is certainly not different from Eria.

259. E. nana, *Ach. Rich. in Ann. Sc. Nat.* ser. ii. xv. 19.
Nilgherries, *A. Richard*, *Wight* (171, 172).

My authentic specimens from A. Richard are identical with Wight's 171. His 172 is somewhat different, with flowers as large as those in Richard's very bad figure of his *Dendrobium microbolbon*, which looks as if it had been made up from the leaves and flowers of *E. nana*, while the dissections belonged to another plant. The thin broad obovate leaves of this have, however, no resemblance to Richard's figure.

260. E. MUSCICOLA; foliis binis lanceolatis basi angustatis scapo apice bifloro æqualibus, bracteis cucullatis membranaceis cuspide herbaceo flore breviore, sepalis petalisque lineari-lanceolatis æqualibus ascendentibus, labello lanceolato canaliculato dorso pubescente.

Dendrobium muscicola, *Lindl. Gen. & Sp.* 75.

Ceylon, *Champion, Gardner* (853).

I can only find 4 pyriform pollen-masses in the single flower at my disposal. The whole plant not more than 2 inches high. Flowers resemble those of *Eria nana* on a very small scale. Since it has never been found among collections from the N. of India, it is probable that the old locality "Nepal," was erroneous.

261. E. microchilos. (Dendrobium microchilos, *Dalzell, in Hooker's Journ.* iii. 345.)

On Mango trees in Western Bengal, *Dalzell, Stocks* (28).

I have this as *D. fimbriatum* of Dalzell, out of Stocks's herbarium; it is certainly distinct from that plant, although very much like it. The flowers are smaller, more fleshy; and the lip is slightly unguiculate, then irregularly widened and thick-edged, after which it contracts into a thin-edged acute apex. Only two pairs of pollen-masses could be found in the flowers I dissected. The tubercles at the base of the lip, spoken of by Mr. Dalzell, I have not succeeded in finding.

262. E. Dalzelli. (Dendrobium Dalzelli, *Hooker, Journ. Bot.* iv. 292. Dendr. fimbriatum, *Dalzell,* l. c.—Dendr. filiforme, *Wight, Ic.* 1642.)

Western Ghauts, on trees, *Dalzell*; hollow trees in the ruins, *Stocks* (27); Concan, *Law* (*hb. Hooker.* 166, 91); Bombay Presidency, *Dalzell* (*hb. Hooker.* 167).

I am not surprised at Mr. Dalzell's having taken this for *E. microchilos*, as he tells us was the case; for the two are exceedingly similar, as is indeed shown by so accurate an observer as Stocks having given the name of *microchilos* to specimens now before me. The flowers are, however, rather larger and less fleshy; the lip is membranous, ovate-lanceolate, and distinctly serrulate towards the point. As to the marginal glands of the sepals, which gave rise to the name *fimbriatum*, they are very evanescent, and I suspect sometimes altogether absent. They are hardly discoverable in Mr. Law's Concan specimens. Imperfect specimens from Ceylon (2353 Hb. Hooker.) probably belong here. Of the eight pollen-masses, four are quite rudimentary.

263. E. ARTICULATA; pseudobulbis oblongis in catenæ speciem articulatis, foliis ......, scapo setaceo flexuoso 5-7-floro, bracteis ovatis cucullatis, petalis acutis multo brevioribus.

Ceylon, *Mrs. General Walker* (*hb. Hooker.*); *Gardner.*

Of this singular plant I have a fragment from Gardner, and several are preserved in the Hookerian herbarium, but all without leaves. The pseudobulbs are oblong shrivelled bodies, jointed into a sort of chain or necklace. The flowers are very small and with no elongation of the sepals. Neither lip nor pollen-masses are known to me.

264. E. pusilla. (Conchidium pusillum, *Griffith, Not.* 321. t. cccx.—Phreatia uniflora, *Wight, Ic.* t. 1734.).
Khasija, *Griffith*; Churra Punjee, *Id.* (666).

This, the original Conchidium, has not eight equal pollen-masses, as is represented in the figure of Wight's artist, but they are even more unequal in size than is shown in Griffith's plate. It is not in the Khasija collections formed by Hooker and Thomson.

265. E. sinica. (Conchidium sinicum, *Lindl. in Hooker's Journ.*)
Hong Kong, *Champion* (278).

Differs from the last in the sepals and petals not being acuminate, in the lip being serrated; the scape is both 1-flowered and 2-flowered. I fear, not distinct from the Khasija species.

§ II. Dendrolirium, *Blume*.

If we collect into one group all the large-flowered woolly species with pseudobulbs only, an assemblage will be formed both natural and obvious, to which Blume's happy name of Dendrolirium may be applied. Some terete-leaved plants can hardly indeed be said to form pseudobulbs; but their leaves fall eventually from the summit of very short stems altogether analogous to pseudobulbs, although unlike in form. Two divisions are effected by taking into account the form of the leaves.

A. *Leaves flat and broad.*

266. E. ornata, *Lindl. Gen. & Sp.* p. 66. (E. armeniaca, *Id. Bot. Reg.* 1841, t. 42.)
Moulmein, *Griffith*; Khasija, at 2000 feet, *J. D. H.* (66); Java, *T. Lobb* (219); Philippines, *Cuming*.

267. E. AERIDOSTACHYA (*Rchb. f. in litt.*); folio lanceolato-oblongo coriaceo, racemo cylindraceo multifloro ferrugineo-tomentoso, bracteis minutis, mento elongato obtuso rectiusculo, labello lanceolato acuto nudo medio involuto basi concavo.
Batavia, *Loddiges, in hort.*

I learn from Prof. Reichenbach that this is among Zollinger's unpublished Java plants. It resembles what I suppose to be the *Dendrolirium sulcatum* of Blume, but is very much more densely tomentose.

268. E. flava, *Lindl. in Wall. Cat.* 1973.
Sikkim, hot valleys, 1000-2000 feet, *J. D. H.* (63).
β. RUBIDA; floribus minoribus, petalis virescentibus, labelli lobis lateralibus rotundatis.
Sikkim, *Cathcart.*

The type of this plant is the *Dendrobium pubescens* of Sir W. Hooker, well figured and described in the 'Exotic Flora,' t. 124. It is important to observe this, if we are to determine to which of the other nearly-allied woolly species the name belongs. In that plant the lip has scarcely any hairs on the inner surface, and the lateral lobes are extremely short, which is the case with the plants above quoted. The variety β is only known from a native figure; and the account given of it must be judged of accordingly. It looks different, especially as the pollen-masses seem to be long and tapering, not roundish, and plano-convex.

269. E. ELONGATA; pseudobulbis ovalibus, foliis lato-lanceolatis coriaceis acuminatis basi angustatis, racemo niveo lanato elongato distantifloro, bracteis ovatis acutis lævibus dorso lanatis, petalis ovalibus subtrinerviis, labelli lobis lateralibus scabro-tomentosis intermedio subcuneato multo brevioribus rotundatis, clinandrio alte marginato.—(E. flava, *Griffith, Not.* iii. 301.)
Burma; Moulmein, on trees in damp woods, *Griffith* (346); in woods at Zimjaik, *Id.* (347); Moulmein, *T. Lobb.*

As in *E. flava*, the clinandrium is surrounded by a membrane, which in this species is remarkably deep; the lip has rounded lobes, clothed inside with coarse, scattered felt, and the middle lobe has two obscure raised lines as well as a distinct middle line. That it is perfectly distinct from the last is certain; but it varies in the form of its lip, the 346 of Griffith having the lateral lobes rather acute and falcate instead of rounded, and the middle lobe larger, with a more distinct superficial lamella in the middle.

270. E. lanata, *Griffith, Not.* iii. 301.
Mergui, *Griffith* (810).

So much is this in habit like the Sikkim *Eria flava*, that it may be easily mistaken for it; but its petals are linear lanceolate-acuminate, and the long narrow lip has a quadrate cuspidate middle lobe, a long isthmus, and a narrowly wedge-shaped hypochilium with small rounded lobes and three distinct elevated distant ribs. The pseudobulbs are ovate, not oval.

B. *Leaves terete or very narrow.*

271. E. pannea, *Lindl. Bot. Reg.* 1842, *misc.* 79. (E. teretifolia, *Griff. Not.* iii. 298, t. 300. fig. 2; *Itinerary*, 202, no. 1185.)

Bootan, at 3600 feet, on Gordonia, *Griffith*; Khasija, at 2000 feet, and Sikkim, on rocks in hot valleys, *J. D. H.* (62); *T. Lobb.*

A long creeping slender rhizome bears, at intervals of 2 to 4 inches, very short woolly stems, each furnished with from one to four terete fleshy leaves, varying in length from 1 to 6 inches and more, the longest belonging to the Khasija plant. Griffith's figure is thus far bad, that I do not find in his own specimens the lip anything like so wavy as he represents it. I have a very similar plant collected in Borneo? by T. Lobb, with very short one-leaved pseudobulbs that touch each other, and leaves more linear; but my solitary flower does not bear examination.

272. E. SICARIA; pseudobulbis oblongis 1–2-phyllis, foliis linearibus carnosis acutissimis semiteretibus, racemis lanatis lateralibus multifloris folio multo brevioribus, bracteis ovatis patentibus intus glabris, floribus albo lanatis, labello .... apice convexo apiculato.

Mergui; Tharapown, in woods, *Griffith.*

"*Folia* carnosa, linearia. *Sepala* extus albovelutina, intus cum petalis viridescentia, lateralia maxima purpureo lineata et notata. *Labellum* albofuscum, intus brunneum disco calloso." *Griffith, MSS.*

Very like a narrow-leaved *Eria flava*. Leaves about 6 inches long, resembling slender stilettos, but tapering at the base into a furrowed petiole. My flowers give no more information.

§ III. XIPHOSIUM, *Griff.*

Although this supposed genus is undoubtedly an Eria, it may form a section sufficiently distinguished by its large smooth flowers and distinctly-formed pseudo-bulbs. It only differs from Dendroliria in the flowers not being woolly.

273. E. rosea, *Lindl. in Bot. Reg.* t. 978.

Hong Kong, *Champion* (275).

This certainly differs from the next, with which I formerly confounded it, in its broad blunt lip with the lower half much wider than the upper.

274. E. carinata, *Gibson, in Calc. Journ. Nat. Hist.* v. 365. (Xiphosium acuminatum, *Griffith*, l. c. c. *ic.*; *Itin. Not.* 78, no. 1153; *Notul.* iii. 332, t. 316.—E. rosea, *Wall. Cat.* 7409.)

Khasija, *Griffith*; Sylhet, *Wallich.*

Differs from the last in having the sepals, petals, and lip acuminate, the middle lobe of the latter being as wide as the hypochil, which has two continuous, not interrupted, rugose elevated lines. Not among the collections of Hooker and Thomson.

275. E. SCABRILINGUIS; pseudobulbis ovatis sulcatis, foliis binis oblongo-lanceolatis trinerviis, racemo oblongo erecto densifloro, labelli trilobi aspero-cristati lobis lateralibus brevibus acutis intermedio rotundato.

Sikkim, *ic. Cathcart.*

Flowers pale green. Lip deep violet. I have seen no specimen of either this or the next.

276. E. VITTATA; pseudobulbis oblongis, foliis binis oblongo-lanceolatis 5-nerviis, racemo oblongo elongato pendulo densifloro, labello oblongo costis 3 elevatis marginibusque crispis.

Sikkim, *ic. Cathcart.*

Flowers larger than in the last, pale green with crimson stripes; lip the same colour, but paler.

§ IV. TYLOSTYLIS, *Blume, Fl. Jav.* p. vi. (Callostylis, *Id. Bijdr.* 340.)

The long slender curved column and unguiculate roundish undivided lip of these plants make it convenient to place them in a section by themselves, especially considering their peculiar inflorescence, consisting of flat round woolly horizontal bracts.

277. E. pulchella, *Lindl. in Wall. Cat.* no. 7407; *Bot. Reg.* 1841. *misc.* 106.

Malacca, *Cuming.*

This is possibly the *Callostylis rigida* of Blume's Tabellen, 74; but if so, the figure is a bad one.

278. E. DISCOLOR; pseudobulbo in caulem subarticulatum extenso, labello oblongo subcordato acuto glabro concolore.

Sikkim; Glen Cathcart, 3000–4000 feet, *J. D. H.* (168).

I have seen no flower of this, and therefore trust to one of Mr. Cathcart's drawings, and a solitary specimen of the stem and leaves. It is much like the last; but the lip appears to be longer than broad, as well as whole-coloured and smooth, while in *E. pulchella* it is broader than long, yellow with a small purple disk, and conspicuously tomentose.

§ V. MYCARANTHES, *Blume.*

The only species figured by Blume, *M. latifolia*, is an Eriura. Whether his *M. obliterata* and *lobata* belong to the same section is uncertain, nothing being known about them. With me, the species are only the following, easily known by their dense spikes of small woolly flowers, the lateral sepals of which have scarcely any obliquity.

279. E. stricta, *Lindl. Coll. Bot.* t. 41 B. (E. secundiflora, *W. Griff. Not.* iii. 302. t. 301.—Mycaranthes stricta, *Lo.* 63; *Wight, Ic.* 1733.)
On the Naga hills, on a species of Gordonia at the elevation of 3500 feet, *W. Griffith*; Darjeeling, *Id.*; Malacca, *Id.* fide cl. *Wight*; Sikkim, at 3000 feet, and Khasija, at 4000 feet, *J. D. H.* (59).

280. E. retusa, *Rchb. f. in Bonplandia, March* 1, 1857. (Phreatia retusa, *Lindl. Orch.* p. 64.—Dendrolirium retusum, *Blume, Bijdr.* 351. —Bryobium pubescens, *Lindl. in Bot. Reg.* 1838, *misc.* no. 145.)
Java, *Zollinger*.

The extrication of this synonymy is due to Prof. Rchb. fil.

281. E. MERGUENSIS; caulibus cæspitosis carnosis clavatis, foliis papyraceis oblongis basi angustatis apice obliquis uncinulatis, spicis lateralibus elongatis griseo-tomentosis pedunculo evaginulato, floribus (minimis) pilosis, labello trilobo infra isthmum transverse lamellato.
Mergui, *Griffith* (1034); Moulmein, *Lobb*.

Something like a small specimen of *E. stricta*; but the stems are fleshy and clavate, the flowers much smaller and not secund, and the lip quite different.

§ VI. TRICHOSMA, *Lindl. in Bot. Reg.* 1842, t. 21.

Now that the limits of the genus Eria begin to be understood, I must admit that Prof. Reichenbach is right in reducing to its ranks my genus Trichosma, notwithstanding its very peculiar habit. It will now, therefore, stand as a section, distinguished by its great fleshy anther and long slender 2-leaved stems, resembling those of a gigantic Pleurothallis.

282. E. suavis. (Trichosma suavis, *Lindl.* l. c.—Eria cylindripoda, *Griff. Notul.* iii. 299.)
Khasija, *Griffith* (1013, 1258); *J. D. H. & T. T.* (144); Sikkim at 5000-6000 feet, *J. D. H.* (144).

§ VII. HYMENERIA.

This name is proposed for all those species which, to a fleshy somewhat shapeless stem with a few thin leaves, add a many-flowered inflorescence that is smooth or nearly so. Possibly it might be subdivided into those with a dense inflorescence like *E. convallarioides* and *pumila*, and such as have the thin racemes of *E. bractescens*.

283. E. convallarioides, *Lindl. Gen. & Sp. Orch.* p. 70; *Bot. Reg.* 1841. t. 62, 1847, t. 63.

Khasija, *Griffith*; at 4000–6000 feet, *J. D. H.* (60); Sikkim, at 5000 feet, *Id.*, valleys 3000–4000 feet, *Id.*

Varies in the colour of the flowers, and in their size.

284. E. excavata, *Lindl. Gen. & Sp.* p. 67.

This differs from *E. alba* chiefly in having the middle lobe of the lip cordate, acute, ribbed, and much smaller than the middle lobes which are broad, falcate, and acute.

285. E. alba, *Lindl.* l. c. p. 67.

a. Lip white.

Sikkim; Darjeeling, in valleys at 3000–4000 feet, *J. D. H.* (142).

β. Lip yellow.

Sikkim, 4000–5000 feet, *J. D. H.* (68); Mussooree, *Edgeworth.*

In *β* the lateral lobes of the lip are shorter and blunter than in *α*, and the leaves are thinner and more acuminate.

286. E. LINEATA; foliis oblongis subcoriaceis acutis, racemis multifloris, bracteis ovalibus membranaceis reflexis, ovario tomentoso, sepalis ovatis subsecundis, labelli lobo medio subrotundo retuso plano lateralibus obtusis minoribus, axi lineis 3 crassis elevatis ad isthmum evanescentibus.

Java, *hort.* (*Veitch*); Continent of India, *hort.*

This is very like *E. alba α*, and may be a variety; but the flowers are dirty yellow with distinct purple stripes, not white, and are much smaller, the leaves are twice as broad and more coriaceous, and the dull purple blunt lateral lobes of the lip are not wider than the yellow almost 3-toothed middle lobe. It is a garden plant of doubtful origin.

287. E. obesa, *Lindl. Gen. & Sp.* p. 68. (Eria Lindleyana, *Griff. Not.* iii. 300.)

Moulmein and Mergui, *Griffith.*

I have no doubt about the correctness of this identification, notwithstanding that in Griffith's Notulæ it is said to be 554 of his Mergui herbarium, for I have from himself a drawing, made in Moulmein in February 1834, and a specimen from Mergui numbered 374, which agree with his description. Neither Wallich's bad old specimens, nor that from Griffith, have any leaves. He states them to be "lanceolata v. ovato-lanceolata integerrima glabra venosa apice recta v. torta." By a typographical error in the Botanical Register, the stems are said to be 27 instead of 2½ inches long. There is a variety with larger flowers and the lower half of the lip very gradually passing into the upper, formerly named by me *E. trilophota*, which has been found in Moulmein by Lobb as well as by Griffith (no. 370), and is now in cultivation as a Java and even Borneo species, but probably without foundation. The flowers are pure white with a lemon-coloured lip, marked by three longitudinal purple elevated lines.

288. **E. affinis**, *Griff. Not.* iii. 297.
Burma, *Griffith* (1074).

This is remarkable for a very long narrow cuneate lip, with two small acute teeth (or lobes) at the base of a roundish ovate acute terminal lobe; it has also two converging principal veins slightly raised above the surface into a thin narrow edge, interrupted in the middle. The mentum is long, narrow, and obscurely 2-lobed.

289. **E. pulchella**, *Griff. Not.* iii. 297.
Mergui (1055), and on trees in Moulmein (345), *Griffith.*

Resembles *E. bractescens*; but the stems are 3 or 4 inches long and cylindrical, the flowers are yellow, and the lip has three continuous elevated lines, of which the two lateral are shorter and clavate.

290. **E. pubescens**, *Wight. Ic.* t. 1634.
Khasija, *Lobb.*

The lateral veins of the lip rise into short vertical plates near both the points and the base.

291. E. MYSORENSIS; foliis oblongo-lanceolatis conduplicatis nervosis racemis paulo longioribus, ovario pubescente, bracteis ovalibus acutis reflexis glabris, sepalis petalisque acuminatis, labello unguiculato subcordato oblongo acuto juxta basin dilatatam pandurato omnino lævi.
Mysore, *Law.* (Cœlogyne, *Hb. Stocks.* 70.)

292. E. GRAMINIFOLIA; caule elongato vaginis membranaceis laxe vaginato, foliis lineari-lanceolatis gramineis nervosis, racemis tomentosis multo brevioribus, bracteis ovatis reflexis glabris, sepalis ovatis acutis mento brevi, petalis linearibus, labello hastato lobis lateralibus truncatis brevioribus intermedio subrotundo acuto, lamellis 2 oblique transversis bidentatis infra isthmum, ungue lato canaliculato.
Darjeeling, *Griffith.*

293. E. SPHÆROCHILA; caulibus brevibus imbricatis ovatis, foliis lato-lanceolatis membranaceis undulatis racemis tomentosis longioribus, bracteis linearibus acutis erectis, sepalis tomentosis ovatis subæqualibus acutis, petalis conformibus, labelli sessilis lobo intermedio subrepando rotundato venis varicosis lateralibus auriculiformibus.
Khasija, 4000–6000 feet, *J. D. H.* (68).

Like *E. alba* in general appearance, but wholly different in the details of its flowers.

There is also, under the number 68 in Hooker and Thomson's Herbarium, a plant from Gurwhal and Khasija, which is quite different from this, and which may be my *E. acervata*, notwithstanding some discrepancies.

294. E. Dillwynii, *Bot. Mag.* t. 4163, is certainly *E. bractescens* in a state of great vigour.

295. E. ringens, *Rchb. f. in Bonplandia*, is *E. ovata*, Bot. Reg. 1844, sub t. 29.

§ VIII. Eriura.

Under this name may be collected the species having small flowers more or less woolly, very large lateral sepals, and a lip flat at the base, furfuraceous in the axis, with a woolly tubercle at the apex and base, or at least at the apex. *E. javensis*, *abbreviata*, and *Sonkaris*, Rchb. f., together with the following, are all at present known with certainty.

296. E. paniculata, *Lindl. in Wall. Pl. as Rar.* i. 32. t. 36.
Sikkim, 10,000 feet, *J. D. H.* (67); rocks near Sarapanee, *Griffith* (1152).

297. E. obliqua. (Mycaranthes obliqua, *Lindl. in Bot. Reg.* 1840, *misc.* 184.)
Singapore, *Cuming, in hort.*

This differs from *E. bifalcis* in the form of the lip and in the presence of a large tumour at the base of the furfuraceous axis.

298. E. MONOSTACHYA; foliis longissimis coriaceis gramineis canaliculatis, racemis longis cylindraceis tomentosis, labelli quadrilobi laciniis triangularibus acutis apicalibus minoribus, lamellis 2 triangularibus aristatis infra isthmum, tuberculis axeos 3 quorum tertium ultra apicem protrusum.
Mount Gembolo, in the east of Java, *Zollinger* (53).

I have this from Prof. Rchb. as *Eria paniculata*, from which it differs in its long cylindrical racemes, and the presence of two sharp-pointed triangular plates below the lateral incisions of the lip, as well as in the other characters above described.

299. E. REINWARDTII; foliis distichis linearibus rigidis apice obliquis acutis, racemo solitario tenui sessili multifloro, labelli quadrilobi basi et apice tuberculati laciniis lateralibus obtusis planis terminalibus subcrispis minoribus.
Java, *hb. Reinwardt.* (*Cymbidium parviflorum*).

Leaves 5 or 6 inches long, somewhat distichous. Spike 4 inches long, terminal, sessile, with small reflexed bracts nearly as long as the ovary.

300. E. BIFALCIS; foliis linearibus coriaceis obtusis apice valde obliquis, spica araneosa dissitiflora simplici terminali, floribus albo-tomentosis, labello cuneato 3-lobo laciniis lateralibus falcatis intermedia oblata tridentata, tuberculo apicis maximo inflexo baseos obsoleto.

Borneo, *T. Lobb.*

In habit much like *E. Reinwardtii*, but not more than 5 or 6 inches high. Flowers the size of *E. obliqua.*

301. E. SCLEROPHYLLA; foliis patentibus duris lanceolatis distichis apice acutissimis obliquis, racemis pluribus elongatis terminalibus albo-tomentosis, labelli cuneati lobis lateralibus acutissimis intermedio a lata basi lineari apice dilatato cuspidato, tuberculo apicis maximo baseos erecto foveato, lamella lineari a quoque isthmo decurrente apice libera.

Java, *Junghuhn* (279).

Much like *E. paniculata*; but the leaves are shorter, broader, and more spreading, and the lip wholly different. No. 300 of Junghuhn seems to be the same, but is only in fruit.

Mycaranthes latifolia, Blume, may also belong to this section.

§ IX. TRICHOTOSIA, *Blume.*

This supposed genus differs in nothing whatever from Eria. It may only stand as a section, with a caulescent habit and flowers covered with coarse ferruginous hairs. The surface and degree of division of the lip offer no available mark of recognition. All the species are conspicuous for the long brown hair that clothes the stem and leaves.

302. E. biflora. (Trichotosia biflora, *Griffith, Not.* iii. 331. t. 315.)

Malacca; on rocks and trees, Goondong Toondook, Mount Ophir, *Griffith.*

Near *E. annulata*, Bl., from which its excessively shaggy lip distinguishes it, as well as the want of the long glabrous recurved bracts of that species.

303. E. PULVINATA; villosissima, caulibus brevibus ascendentibus, foliis ovatis, pedunculis unifloris, sepalis hirsutis in cornu obtusum basi productis ovario æquale, petalis linearibus sepalo dorsali æqualibus, labello obovato emarginato intus piloso infra apicem pulvinato.

Mergui, *Griffith*, no. 2, Aug. 17, 1834.

I only know this from a drawing by Griffith, who represents it as having whitish solitary flowers, with an obcordate-spathulate lip, hairy and speckled with red inside, and a tuft of longer hairs below the apex. The clinandrium is also shown to be 4-lobed. It is probably the same as one of T. Lobb's plants distributed as coming from Borneo, but I suspect from Moulmein, of which

I have an imperfect specimen. In that plant the petals are acute, spathulate, and bordered with brown near the points, and the leaves are linear lanceolate, and much less hairy.

304. E. LEIOPHYLLA; caule ferrugineo tomentoso apice glabro diphyllo vaginis 2 membranaceis oppositis in medio, foliis oblongo-lanceolatis glabris, spica brevissima uniflora (?) arcte tomentosa, bracteis truncatis, labello rhombeo carnoso glabro obtuso basi convexo.
Borneo; on trees, Sarawak, at the height of 2700 feet, *T. Lobb.*

My specimen is nearly glabrous except the inflorescence. The stem is terete, 2-leaved, with a long brown sheath at the base, and a pair of smaller opposite membranous ones in the middle. The lip seems to be deep crimson.

305. E. annulata, *Bl. Mus. Lugd.* ii. 184.

A unique specimen from Sikkim comes near this species; but the flowers are very old. The leaves are broad and hairy, and filled with large masses of calcareous concretions.

306. E. ferruginea, *Lindl. in Bot. Reg.* 1839, t. 35.
E. Bengal; Jyntea mountains, at the height of 4000 feet, *J. D. H.* (65); Khasija, *Griffith.*

307. E. VULPINA (*Rchb. f.*); molliter ferrugineo-villosa, foliis oblongo-lanceolatis papyraceis obsolete nervosis, spica multiflora recta lanata, bracteis ovatis recurvis, floribus distantibus mento rotundato, petalis linearibus brevioribus ciliatis, labello carnoso glabro laciniis lateralibus dentiformibus intermedia rotundata.
Philippines, *Cuming.*

This is the plant hastily referred to in the Botanical Register (1845, t. 2) under *E. vestita*; but a more careful examination shows it to be quite distinct in its straight, not flexuose rachis, ovate not acuminate bracts, round, not elongated chin, short ciliated, not long smooth petals, and in the whole superficies of the lip, which appears to want the hairs and lamellæ of *E. vestita.* I have not been able to observe the tubercle seen at the base of the limb by my learned friend *Rchb. f.*; but the lip is so fleshy and compressed when dry, that I may have missed it.

308. E. CAPITELLATA; caulibus ad insertionem foliorum juniorum ferrugineo-hirtis, foliis carnosis anguste lanceolatis acuminatis glabriusculis, spicis brevibus densifloris, sepalis lateralibus ovatis, labello concavo carnoso ovato apice decurvo sub lente tomentoso infra apicem convexo.
Java, *T. Lobb* (253).

Until I received a specimen of the real *E. annulata*, I mistook this for it. There are, however, these differences: the leaves are twice as broad and much less acuminate; the spikes are so dense as to be almost ovate; the lateral sepals are not acuminate; the lip is more rounded at the point and without the raised median line, instead of which there is only a slight convexity above with a corresponding concavity below. The *linea verruculosa*, ascribed by Blume to his *E. annulata*, does not exist in Zollinger's no. 15 of his second collection, which I take for that species; but there is a distinct elevated even midrib, with a slightly raised line on either side.

§ X. Cylindrolobus, *Blume, Fl. Jav. præf.* vi. (Ceratium, *Id. Bijdr.* 341.)

There is nothing in the structure of the plants of this section, as far as I am acquainted with them, that corresponds with the character proposed by Prof. Blume in his *Mus. Lugd. Bat.* ii. 182. Undoubtedly a protuberance at the foot of the column does sometimes occur, but it affords no sectional mark; for if it exists in *E. nutans*, it is not to be found in *E. Khasiana*, which is only distinguishable upon careful examination; and it is a mere rudiment in *E. bicolor*, another very closely allied species. The siliquose fruit is of as little importance. I think, however, that the section may be conveniently adopted for all the caulescent species whose flowers, whether lateral or terminal, are solitary or in pairs, and arise from among empty coloured bracts. Such is the principle upon which the following have been collected.

A. *Flowers terminal.*

309. E. TRUNCATA; foliis 3 lanceolatis terminalibus apice subæqualibus, floribus geminis ovario tomentoso, sepalis oblongis obtusis, petalis subæqualibus antrorsum arcuatis, labello carnoso truncato linea media tenui elevata infra apicem triplici.

Moulmein, on Shoung-gyen at the height of 5000 feet, *T. Lobb.*

"Flowers white." The lip has two small ovate lateral lobes; but the middle lobe is obsolete, appearing only in the form of a broad line lying between the side lobes.

310. E. pauciflora, *Wight. Ic.* t. 1636.

Khasija hills, *T. Lobb*; Nilgherries, *Wight.*

Wight's figure of this is unusually good. The withered reflexed sheath at the base of the last joint of the stem seems to be characteristic of the species.

311. E. bicolor. (Dendrobium bicolor, *Lindl. Gen. & Sp.* p. 90.)

Ceylon, *Thwaites* (2761).

I have been favoured by Mr. Thwaites with a sketch of this, showing it to be a true Eria. The pollen-masses were previously unknown to me. A re-examination of the old fragments in my herbarium has shown the lip to be much like that of *Eria pauciflora*, as represented in Wight's plate, but with a shorter middle lobe. There is a small orange-coloured process at the base of the column. The surface of the middle lobe of the lip is rather pulverulent.

312. E. nutans. *Lindl. Bot. Reg.* 1840, *misc.* 196.
Singapore, *Cuming in hort. Loddiges.*

In this plant there is a large tubercle on the foot of the column, which is very short.

313. E. KHASIANA; foliis binis (?) lanceolatis acutis, floribus geminis glabris, sepalis petalisque subæqualibus, labello obovato laciniis lateralibus membranaceis obtusis subfalcatis incurvis intermedia oblata carnosa lamella tomentosa in medio lineisque 2 truncatis secus axin pulverulentum, columnæ pede omnino nudo.
Khasija, *Griffith.*

Much like *E. nutans* and *pauciflora*, but entirely different in the form of the lip.

B. *Flowers lateral.*

314. E. clavicaulis, *Lindl. in Bot. Reg.* 1840, *misc.* 219.
Khasija, at 4000–5000 feet, *J. D. H. & T. T.* (9).

The specimens in hb. Hooker. are not in flower, so that some uncertainty attends this species. It approaches the last section in having the leaves at the end only of the stem; and the flowers are almost terminal.

315. E. mucronata, *Lindl. in Bot. Reg.* 1842, *misc.* 27.
Philippines, *Cuming.*

Blume's *E. elongata* seems to be near this; but in my plant the little tuft of hairs at the base of the lip cannot be called "tuberculum dilatatum dense glanduloso-fimbriatum." Among De Vriese's Sumatra drawings is a "Dendrobium macranthum," with large solitary white flowers, very short lower sepals, and violet spreading bracts, which may be this *Eria elongata.* What appears to be the same plant exists in the Hookerian herbarium, collected in Tobie Island by Barclay.

316. E. brachystachya, *Rchb. f. in Bonplandia.*
Philippines, *Cuming.*

In this, which is perhaps a variety of the last, there is a small truncated tubercle on the foot of the column.

317. E. VALIDA; foliis oblongo-lanceolatis coriaceis apice valde obliquis obtusis, pedunculis bifloris bracteis ovatis erectis papyraceis cucullatis, floribus glabris, sepalis lateralibus ovatis dorsali petalisque 3-nerviis oblongo-linearibus, labelli lobo intermedio oblongo rotundato margine papilloso lateralibus duplo brevioribus acutis sinubus rotundatis apertis, lineis tribus clavatis apice divergentibus infra isthmum.
Java, *T. Lobb* (205).

A stout erect plant, with a stem half an inch in diameter, and leaves 6 inches long. I can find no tubercle on the foot of the column; nor can I identify it with any of Blume's plants.

318. E. APOROIDES; foliis brevibus obtusis acinaciformibus equitantibus, pedunculis unifloris, bracteis linearibus obtusis carnosis, floribus glabris, sepalis petalisque ovatis obtusis, labello acute 3-lobo lobo intermedio majore carnoso.
Philippines, *Cuming*.

This has very much the appearance of the plant figured by Adolphe Brongniart as *Aporum incrassatum* (Duperrey, t. 42 B); but the lip is 3-lobed, not entire.

§ XI. UROSTACHYA.

The caulescent species with numerous leaves, and long racemes or panicles of flowers, without the woolly lip-appendages of § ERIURA, form a natural group which may be conveniently placed apart from others. The flowers, with the exception of *E. bambusifolia*, are very small and densely arranged.

319. E. floribunda, *Lindl. in Bot. Reg.* 1844, t. 20.
Java, *hb. Junghuhn* (307); Mergui, *Griffith*.

Of this *E. leucostachya* of the Hort. Soc. Journ. III. xv. and xvi. is, as was then suggested, a mere variety.

320. E. micrantha, *Lindl. Gen. and Sp. Orch.* p. 68.
Java, *Lobb* (314).

The *Octomeria racemosa* of Kuhl and Hasselt seems, from a tracing sent me by Prof. Reichenbach, to be this plant, which is very like *E. floribunda*, but with smaller flowers, and with the lip-auricles perfectly lateral and not intralabellar.

321. E. PACHYSTACHYA; foliis oblongo-lanceolatis nervosis, spicis densissimis elongatis glabris, bracteis squamiformibus reflexis, floribus (minutis) tomentosis mento elongato incurvo, petalis glabris linearibus obtusis falcatis sepalis brevioribus, labello sessili oblongo acuto lævi.
Java, *Junghuhn* (298).

322. E. RETROFLEXA; foliis anguste oblongis spicis tenuibus duplo

longioribus, bracteis oblongis glabris retroflexis, floribus glabris, sepalis petalis labelloque subæqualibus ovatis acutis.

Philippines, *Cuming*.

The lateral sepals are very little oblique, and the lip is scarcely distinguishable except in being more fleshy; it is quite destitute of all superficial processes.

323. E. BAMBUSIFOLIA; foliis oblongis acuminatis nervosis paniculis terminalibus laxis tomentosis multifloris subæqualibus, sepalis ovatis obtusis tomentosis, petalis obovatis acutis, labello ovato plano glabro inappendiculato apice dilatato.

Khasija, *Griffith*; at 2000 feet, *Mr. Simons, in hb. Hooker*. (64).

I have no species very nearly allied to this, whose great leaves resembling a Bamboo, and loose tomentose terminal panicles as much as 10 inches long, are very peculiar.

PHREATIA, *Lindl. Gen. & Sp.* p. 63.

Prof. Reichenbach has detected the identity of Plexaure, *Endlicher*, with this well-marked genus. But he has referred it to Eria, to which I must withhold assent. The bifid somewhat cartilaginous rostellum, which led Endlicher to refer the genus to Neottieæ, appears to afford an absolute mark of distinction, especially when accompanied, as in this case, by a very peculiar and scarcely mistakeable habit. Blume refers *Phreatia elegans* to Thelasis (*Mus. Lugd. Bat.* ii. p. 187), for reasons which I am unable to appreciate. No two genera can be more wholly distinct. In Hooker and Thomson's herbarium one species only occurs; but a few may be added from other sources, in addition to those described by Prof. Reichenbach.

324. Phreatia elegans, *Lindl.* l. c. (Thelasis elegans, *Blume, Mus. Lugd.* ii. 187.)

Khasija, 4000 feet, *J. D. H. & T. T.* (93).

325. PH. MYOSURUS; foliis membranaceis late loratis planis apice obliquis cuspidatis basi equitantibus, spicis elongatis folio multo longioribus, floribus subverticillatis, bracteis fuscis acuminatis floribus longioribus, labello cuneato juxta apicem biplicato quasi trilobo. (Eria [Phreatia] myosurus, *Rchb. f. in Bonplandia*, March 1, 1857.)

Java, *Lobb* (166 *in hb. Hooker*.).

The largest of the genus except A. Richard's two "Oberonias," *gladiata* and *micrantha*, which Professor Reichenbach has pointed out to be Phreatias. *O. micrantha* especially seems very near this; but the bracts are represented as being much shorter than even the pedicels. Flowers very small, hardly longer than the cinnamon-brown bracts, and arranged in a somewhat verticillate manner. The lip is so dilated and folded near the end as to seem to be 3-lobed.—Possibly A. Brongniart's *Oxyanthera micrantha* may be this; but if so, the inflorescence is taken from another plant, perhaps the Thelasis, which furnished his magnified dissections (as Prof. Reichenbach has pointed out to me in conversation). My learned friend's definition of his *Eria myosurus* appears to have been taken from an incomplete specimen, for which reason the above specific character is now proposed.

326. PH. MINUTIFLORA; foliis linearibus coriaceis recurvis equitantibus obtusis spicis tenuibus æqualibus, bracteis triangulo-setaceis, labello obovato concavo.

Borneo, *Lobb.*

Leaves about 2 inches long. Flowers the smallest in the genus, in an erect very slender spike. Bracts brown, setaceous, broad at the base.

327. PH. MICROTIDIS; foliis linearibus coriaceis equitantibus apice acutis recurvis spicis densis angulatis æqualibus, bracteis floribus brevioribus, labello orbiculari concavo basi pandurato.

Java, *Lobb.*

Much like a pigmy *Microtis*, the whole plant not exceeding 2 inches in height. Blume's *Dendrolirium pusillum*, formerly referred by me to Phreatia (Gen. & Sp. p. 64), seems to be rather an Appendicula, and can have nothing to do with the present species.

328. PH. TAHITENSIS; folio oblongo coriaceo plano oblique bilobo spicæ densæ multifloræ æquali, scapo trivaginato, mento oblongo obtuso, labelli acuti rhombei longe unguiculati angulis lateralibus runcinatis, bracteis oblongis herbaceis acutis canaliculatis florum longitudine.

Tahiti, *Bidwill.*

Plant between 3 and 4 inches high, of which 1½ inch is occupied by a dense spike whose flowers are the largest in the genus, measuring in their dried state nearly ⅕th of an inch in length. The lateral sepals are extended into a long blunt chin, which probably led M. Reichenbach to remark, that "here the genera Phreatia and Eria run together." But the cartilaginous bifid rostellum of the former genus is perhaps more strongly marked in this than in any other species.

THELASIS, *Blume.*

The extremely short characters assigned by Prof. Blume, both in his 'Bijdragen,' and in his recent 'Museum Lugd. Bat.,' to the species of this curious genus, render all attempts at identifying his plants almost hopeless—especially since, in the latter work, he has referred to the genus so wholly different a plant as *Phreatia elegans*. The only species known at present on the continent of India itself, furnishes some addition to the perplexity that surrounds the genus.

329. Th. pygmæa. (Euproboscis pygmæa, *Griffith, in Calcutta Journal of Nat. Hist.* v. 372. t. 26; *Wight. Ic.* t. 1732, not 1733.)

Khasija hills, *Griffith, Lobb*; at 2000–4000 feet elevation, flowers white, *J. D. H. & T. T.* (29).

Griffith's figure of his *Euproboscis pygmæa*, in the Calcutta Journal, is sufficient for the identification of this plant, which seems to be common on the Khasija mountains. In that work the name *E. Griffithii*, quoted by Prof. Reichenbach (Bonplandia, Feb. 15, 1857), does not occur. Prof. Blume refers it to his *Th. capitata* which differs in having a "spica densa ovoidea deinde cylindrica," and an ovate obtuse lip, a description that in no way applies to this. Dr. Wight's figure is a good one, but from a small specimen whose flowers are in a state of Peloria. The name *pygmæa* is objectionable, for there are specimens before me as much as 8 inches high; it must however stand. A Thelasis from Hong Kong, sent by Dr. Hance (287), appears to be either this or *Th. triptera*; but my specimens are not good enough for positive determination.

330. TH. OCHREATA; folio coriaceo lorato obtuso canaliculato basi squama maxima laxa truncata stipato, scapo foliis duplo breviore vaginis maximis laxis truncatis baseos binis medii solitaria, spica densissima bracteis reflexis acutis amplexicaulibus duris concavis, ovario obovato, sepalis alte carinatis supremo galeato, labello ovato obtuso.

Borneo; low forests of Sarawak, *T. Lobb.*

I should have thought that this might have been Blume's *Th. capitata*, judging from his latest definition; but Prof. Reichenbach, who has carefully examined that plant, describes the leaves as cuneate and equally 2-lobed, and the sepals entirely without carinæ. The leaves are a foot long when full-grown.

I have two or three more species of the genus, but until some authentic evidence concerning Blume's plants reaches me, I cannot venture to name them.

A Note upon PSEUDOCENTRUM, a New Genus of *Orchidaceæ*.

By Prof. LINDLEY, F.R.S.

[Read March 4th, 1858.]

AMONG the numerous collections of Peruvian Orchids which have been communicated to me from time to time by my excellent correspondent Professor Jameson, there is one possessing so very extraordinary a structure that it seems worthy of being brought separately under the notice of the Society, although nothing more is known of it than that it is a terrestrial plant from the valley of Lloa, a couple of spikes of flowers having alone reached me.

These spikes are dense, erect, cylindrical, 10 inches long, and very slightly coated with minute distant hairs. A thin lanceolate three-veined bract supports each flower, reaching beyond the summit of the ovary. The flowers themselves are not unlike, in general appearance, those of a minute *Aconitum lycoctonum*, being furnished with what seems at first sight to be a slender curved galea many times longer than the limb; but upon dissection this galea proves to consist of the two lateral sepals excessively produced at their base and forming a sheath, within which the labellum lies concealed. Thus far there is nothing in the structure to which a parallel may not be found elsewhere, as in Dendrobium, Bifrenaria, Comparettia, and especially in Pelexia, a genus to which the plant before us is nearly allied. But when the labellum is examined, it is found to be extended within the fold of the lateral sepals, not in the form of a spur arising from its base, but in that of a long slender channeled body proceeding from its point, the base of the labellum being acutely hastate. In other words, the labellum is sessile, hastate, 3-lobed, with the middle lobe extremely long, linear, channeled, and directed upwards between the sepals which conceal it. In this manner the appearance of a spur is produced without recourse being had to the arrangement which occurs in every other genus of this large order, hitherto described; for which reason I propose the name PSEUDOCENTRUM, to which the following technical character may be added:—

PSEUDOCENTRUM (Genus Neottiearum Pelexiæ affine). Herba terrestris;......... *Spica* elongata, densa, striata, cylindracea. *Ovarium* rectum. *Sepalum* anticum parvum, lanceolatum, patens; lateralia dorsalia, multo majora, triangularia, basi in canalem longum ascendentem arcuatum obtusum producta. *Petala* lineari-lanceolata, apice recurva, sepalo antico breviora. *Labellum* membranaceum, sessile, trilobum; lobis lateralibus acutis hastam referentibus, intermedio lineari, canaliculato, intra canalem sepalinum incluso eique æquali. *Columna* nana, semiteres; stigmate depresso marginato, rostello acuminato. *Anthera* dorsalis apiculata, bilocularis (?); *pollinia* 4, pulverea, lateralia majora glandula parva oblonga.

Sp. 1. *Pseudocentrum macrostachyum.* Peru, *Jameson.*

Synopsis of *Legnotideæ*, a tribe of *Rhizophoraceæ*.

By George Bentham, Esq., F.L.S.

[Read March 4th, 1858.]

Among the plants of the great East Indian collection distributed by the late Dr. Wallich, is one from Heyne's Peninsular Herbarium, entered in the catalogue under the number 6320 as *Blepharistemma corymbosum*, Benth. I have no recollection nor any record of having ever given it that name, and I feel certain that I never examined it. The specimen which I received from Dr. Wallich in 1832 has remained ever since unnamed in my herbarium, but meeting with it accidentally a short time since, and ascertaining that it bore a name supposed to have been given by myself, I have been led to examine it in detail, and to pass in review the allied genera forming the small but interesting group of *Legnotideæ*, a tribe of *Rhizophoraceæ*. Although most of these genera have been well described by Arnott, Blume, Korthals, Asa Gray and others, yet as they have not all been brought together in a comparative form, I am induced to lay before the Linnean Society a short synopsis of the tribe.

The *Legnotideæ* agree with the true *Rhizophoreæ* in their opposite undivided leaves with interpetiolar stipules, their axillary inflorescence, valvately lobed calyx, perigynous petals often fringed or divided at the top and folded over the anthers in the bud, their perigynous definite stamens with versatile 2-celled anthers, their several-celled ovary with two or more collateral or clustered pendulous ovules in each cell (rarely one-celled by the disappearance of the dissepiments between the placentas), and in their simple style with a capitate or discoid stigma, either entire or radiating into as many lobes as placentas. The chief difference consists in the seed, which in the true *Rhizophoreæ* is exalbuminous, the embryo germinating and forcing its radicle through the pericarp whilst still adherent to the tree; whereas in the *Legnotideæ* the embryo is imbedded in a fleshy albumen. In the true *Rhizophoreæ* the seed-bearing part of the ovary is inferior or adnate to the base of the calyx; in the *Legnotideæ* it is either inferior, or superior and free with the exception of the broad base.

With regard to the affinities of *Legnotideæ* as illustrating those of *Rhizophoraceæ*, there is little to add to those suggested by R. Brown in the Appendix to Tuckey's 'Congo,' p. 437, and confirmed by subsequent observers,—a general affinity with *Cunoniaceæ* and with *Lythraceæ*. With the former, *Legnotideæ* agree in their opposite leaves with interpetiolar stipules, their valvate calyx, and in many respects in the general arrangement of the parts of the flower; but differ in inflorescence, in the æstivation of the petals, in the more complete consolidation of the styles (although in the latter respect they agree with *Broussaisia*), and in the pendulous collateral or clustered ovules. With *Lythraceæ* they agree more generally in habit and inflorescence, in the æstivation of the calyx, and completely consolidated styles; and where the ovary is free, it is often enclosed in the base of the calyx, as in *Lythraceæ*; they differ, however, in their dotted leaves, interpetiolar stipules, in the æstivation of the petals and insertion of the ovules, and in their albuminous seeds. The arrangement of the petals and stamens is also somewhat different, even in the genera which have the ovary free, as in *Lythraceæ*. In the latter order, the disk which bears the petals and stamens is so completely combined with the calyx-tube as scarcely to thicken it, or form any perceptible border at its edge, where the petals are inserted close among the calyx-teeth, and the stamens are usually inserted more or less irregularly lower down on the inner face of the disk. In *Legnotideæ*, the disk, whether very short in the base of the calyx-tube, or lining the tube up to the teeth or lobes, is always very perceptible, and sometimes thick and fleshy; its margin is usually more or less prominent, either as an entire or crenate ring, or as a short cup-shaped tube round the ovary; the stamens are usually inserted either on the margin, or more frequently just below the margin on the outside, and the petals outside the stamens at the base of the disk, that is, in the angle which the free part of the disk makes with the calyx-tube. It is probably this disk which induced Dr. Wallich originally to consider the *Gynotroches* as a species of *Microtropis* among *Celastrineæ*.

The fringed and folded petals of most *Legnotideæ* have perhaps some analogy to the crumpled petals of *Lythraceæ*; the manner in which they are folded over the larger stamens, or over all the anthers, has some analogy to the hooded petals of *Rhamnaceæ*, which enclose the anthers in the bud; but there is very little other affinity with that order. So the opposite dotted leaves or the inflorescence give a general resemblance, without much affinity, to *Myrtaceæ* and *Memecyleæ*.

The fringed petals of Gardner's *Anstrutheria* had induced him to refer that plant to *Elæocarpeæ*; but that and the valvate calyx are almost the only characters in which the *Legnotideæ* coincide with that tribe; still less can I see any affinity between *Legnotideæ* and *Loganiaceæ*, near which Lindley places them in his 'Vegetable Kingdom.' The free petals and their æstivation, the stamens inserted on a perigynous disk, not in the tube of an essentially gamopetalous corolla, the placentation and other points, appear to me to remove them far away from any of the orders between which the *Loganiaceæ* form the connecting link.

The number of genera of *Legnotideæ* now known is nine; but as they most of them consist of only one or two species, and some are but imperfectly known, it is probable that a better acquaintance with the flora of their chief geographical area—across tropical Africa, through the Mascarene Islands, Ceylon and the Indian Archipelago to tropical Australia,—may enable their future consolidation into natural groups. Of these genera, three, *Carallia*, *Pellacalyx* and *Haplopetalum*, have the seed-bearing part of the ovary and fruit completely adnate or inferior; three, *Gynotroches*, *Crossostyles* and *Anstrutheria*, have the ovary superior, but attached by a broad base to the broadly turbinate calyx-tube; and the remaining three, *Blepharistemma*, *Dactylopetalum* and *Cassipourea*, have the ovary much less dilated at the base, quite free within a campanulate or ovoid calyx, as in *Lythraceæ*.

CARALLIA.

This genus, originally established by Roxburgh, has been more accurately described in detail by Blume, Mus. Bot. vol. i. p. 128. He shows that although the fruit is often by abortion one-celled and one-seeded, the ovary is divided into 4 or rarely 3 or 5 cells with 2 pendulous ovules in each; not one-celled, as stated in Arnott's observations, 'Ann. Nat. Hist.' i. p. 371, in consequence probably of Roxburgh's having so described one of his species. Blume also first described the albuminous seeds of *Carallia* with a curved embryo, which I have verified in different specimens of *C. integerrima*, and in the *C. lanceæfolia* also, as far as I could tell in a not quite ripe fruit.

With regard to the species of *Carallia*, they have evidently been much multiplied. There is one very common one, extending from Ceylon and the Indian Peninsula to Khasiya, China, the Indian Archipelago and north-west Australia. The leaves in the Cingalese specimens are often all obovate and very obtuse; in some Chinese and Philippine Island ones, narrow-oblong and acuminate; in the majority of specimens from the greater part of the area, oval-elliptical, with or without a short acumen; but in each district these forms appear to pass gradually one into the other, and sometimes on the same specimen. The leaves are generally quite entire; occasionally some may be found with a few very small teeth towards the extremity, but never toothed all round, as in the *C. lanceæfolia*. I have therefore no hesitation in considering this as the *C. integerrima*, DC., to which I would refer the *C. zeylanica, corymbosa* and *sinensis* of Arnott, *C. timorensis*, Bl., *C. octopetala*, F. Muell. (the parts of the flower are often in eights in the Indian specimens), and *Pootia cereopsifolia*, Miq.

C. lanceæfolia, Roxb., is only known to me from specimens from the Calcutta Garden and one or two from Sylhet. It appears well distinguished by the leaves being regularly serrulate all round, and, as far as I have seen, by a more pear-shaped fruit, which appears to ripen generally more than one seed. The leaves are usually considerably broader than those figured by Wight from Roxburgh's drawing. The *C. confinis*, Bl., is evidently closely allied to this species, if not identical with it. *C. symmetria*, Bl., appears to be a form of *C. integerrima* with the leaves slightly toothed at the top.

C. lucida, Roxb., appears to me to be in some respects a made-up species, resulting perhaps in a confusion between *C. integerrima* and *C. lanceæfolia*. The specimens originally sent from the Calcutta Garden as *C. lucida* belong to the broader-leaved forms of *C. lanceæfolia*, although I have not seen any quite so broad as those figured in Roxburgh's 'Coromandel Plants' and in Wight's 'Icones.' Both these figures are taken from Roxburgh's drawings, the work probably of a native artist; and, as is so frequently the case, more or less made up, as is evidenced by the venation of the leaves, so different from that of any *Carallia*. I should therefore be disposed either entirely to reject *C. lucida*, or to consider it merely as an ill-represented variety of *C. lanceæfolia*.

C. celebica, Bl., judging from Borneo specimens which agree with his description, is a distinct species with looser inflorescence, much larger flowers, &c.

C. cuspidata, Bl., and *C. multiflora*, Bl., both from Borneo, but unknown to me, appear from his description to be both of them good species.

Baraldeia, Dup. Thou., is considered by R. Brown, and after him by other botanists, as a species of *Carallia*. It is unknown to me: the Hookerian herbarium, although now rich in Madagascar plants, contains, as far as I can find, no Legnotideous species from that island.

PELLACALYX.

Of the single species known of this genus, *P. axillaris*, Korth., I have seen specimens from Penang, from Phillips's Collection, formerly in the Horticultural Society's herbarium, and among Griffith's Malacca plants. To Korthals's detailed and accurate description I have only to add that the seed, as in *Gynotroches*, is small, ovoid, with a crustaceous testa, and a straight cylindrical embryo in the centre of the albumen. The genus is quite distinct both from *Carallia* and *Haplopetalum* in the form of the calyx and the clustered ovules, as well as in habit and other characters.

HAPLOPETALUM.

I have seen no specimens of this plant; but A. Gray's elaborate description and beautiful plate in the 'Botany of the American Exploring Expedition' are sufficient to characterize it in every respect, excepting the fruit, which is unknown. The habit, inflorescence and flowers are those of *Gynotroches*, except that the petals are sessile and entire, the ovary inferior with a central axis, but not divided into cells, probably from the disappearance of the dissepiments after a very early stage, and that there are but two collateral ovules to each cell.

GYNOTROCHES.

This genus was originally established by Blume in his 'Bijdragen,' but having been referred to *Guttiferæ*, it was very naturally overlooked by Arnott, when describing his *Dryptopetalum*. Blume has subsequently, in his 'Museum Botanicum,' established the generic identity of these two plants, which indeed are probably but one species, not uncommon in the Indian Archipelago. The length of the pedicels and number of parts of the ovary and stigmata vary equally in the Javanese, the Penang, and the Malacca specimens. Blume's third species, however, with minute, almost sessile flowers, from Borneo and Sumatra, is probably distinct. As a genus they differ from *Cassipourea* (of which they have the inflorescence and most of the characters) by the small deeply-cleft calyx, the ovules 4, not 2 only, to each cell of the capsule, and by the terete embryo. As in *Blepharistemma*, the flowers of the common species are to a certain degree diœcious; in some specimens the ovary is slender and empty, whilst the petals and stamens are very fully developed; in others the ovaries are complete and the petals and stamens more or less reduced. This gives to different specimens a very different aspect, and may explain the differences which induced A. Gray to describe as distinct his *G. reticulata* from

Singapore, where, amongst other places, Dr. Wallich gathered the original species.

There are some slight inaccuracies in Blume's dissections of *Gynotroches.* The disk is very incorrectly represented, and in fig. N+, one stamen is inserted outside, and another inside of it; in fact, the filaments are united at their very base into a narrow ring just outside the crenulated margin of the very short disk, whilst the petals are inserted outside the staminal ring. In figs. I+ and N+, the seeds are shown as attached by their lower instead of their upper end. So in fig. O+, the hilum should be represented as near the upper broad extremity, and the upper slender end of the embryo should be the entire radicle, the lower and thicker end being split into the two cotyledons.

CROSSOSTYLES.

Forster's detailed description of his *Crossostyles biflora*, published by Guillemin in his 'Zephyritis Taitensis' (Ann. Sc. Nat. Par. sér. 2. vii. p. 353), enabled Asa Gray to recognize it in the plant which he has figured and described in detail in the Botany of the American Exploring Expedition.' Unfortunately these specimens were in some respects imperfect, and the seed has not yet been described. I have, however, little hesitation in referring to the same genus, as a second species, some fruiting specimens collected on the Feejee Islands by Dr. Harvey, differing from the *C. biflora* chiefly in the smaller narrow leaves and in the reduced number of parts of the pistil. The remains of the stamens show that their insertion and numbers were about the same as in *C. biflora*; but there is nothing to indicate the presence or absence of the *nectaries* of Foster, or *sterile stamens* of A. Gray, so peculiarly characteristic of this genus. It is not stated by either, whether they are precisely in the same ring as the stamens, or a little withinside of them. If the latter supposition be correct, they probably represent, not sterile stamens, but the teeth of the disk, which are more or less prominent within the stamens in several *Legnotideæ.* If really alternating with the stamens in the same verticil, there is nothing in the slightest degree analogous to them in any other genus. The seed of *Crossostyles Harveyi* has an embryo much nearer to that of *Cassipourea* than that of *Gynotroches.*

ANSTRUTHERIA.

This genus was originally proposed by Dupetit Thouars in his 'Genera Nova Madagascariensia,' under the name of *Richæia.* It has since, however, at the suggestion of R. Brown (in the Appendix to Tuckey's 'Congo'), been reduced by DeCandolle in his 'Prodromus' to *Cassipourea*; and I described as such, in the 'Niger Flora,' a West African species, which, as I there mentioned, may not improbably be the Congo *Cassipourea* referred to by R. Brown. In the mean time Gardner met with a plant in Ceylon, which he did not immediately recognize as belonging to this group, but conceived to be allied in its fimbriate petals to *Elæocarpeæ*. He accordingly described and figured it in the 'Calcutta Journal' as a new genus of that order, under the name of *Anstrutheria*. Subsequently Major Champion, in a note addressed to Dr. Gardner in 1849, pointed out its relation to *Cassipourea*, and in the Hookerian herbarium it is identified generically with *Richæia* both by Sir W. Hooker and by Planchon. Under these circumstances, the genus, if maintained as distinct from *Cassipourea*, should have retained Dupetit Thouars' name of *Richæia*, were it not that it may be considered as too close, both in sound and derivation, to the previously published *Richea* in *Epacrideæ*. Its union with *Cassipourea* can only be effected with propriety, in the present state of our acquaintance with these plants, by uniting into one genus all the *Legnotideæ* with a free or superior ovarium, from *Gynotroches* to *Cassipourea*. If that view be adopted, the six genera here characterized may be considered as so many sections, and *Anstrutheria* will still be the name to be preferred, whether for a section or a genus. The three species it comprises are evidently closely allied to each other. I have seen abundance of good specimens of the Ceylonese one, which varies with broadly ovate, almost membranous leaves, or much narrower and more coriaceous ones. From the latter form, the West African specimens, which I have in fruit only, and in very young bud, appear scarcely to differ, except in the size of the flowers, which appear to have been considerably smaller; and I have seen no specimen of the Madagascar one. I am therefore quite unable to give at present any distinctive diagnosis of the three species, if such they be.

BLEPHARISTEMMA.

The history of the name and original specimen of the only species constituting this genus has been already given. It was also collected in the Indian Peninsula by Hochstetter, and has been distributed with his Canara plants under the name of *Dryptopetalum membranaceum*, Miq. It is, however, much nearer related to *Cassipourea* than to *Gynotroches*; it scarcely differs indeed from the American *Cassipoureas* except in habit and inflorescence, in its almost diœcious flowers, and in the rather more dilated stigma. Still the habit is so distinct, that it cannot be joined with *Cassipourea*, unless, as before mentioned, the whole six genera are united into one. The leaves appear to be deciduous, and have none of the coriaceous texture which all other *Rhizophoreæ* acquire, at least when full-grown; the loose cymes are like those of several *Lythrarieæ*. The perigynous disk is cupular, as in *Cassipourea*, but much more developed.

DACTYLOPETALUM.

This genus is founded on a single specimen gathered on the island of Nossi-bé, off the north-west coast of Madagascar, by Boivin. With the habit, inflorescence, and most of the characters of the American *Cassipoureas*, I could not include it in that genus on account of the structure of the ovary, which has no dissepiments and only two pairs of pendulous ovules round the central axis, and the stamens are only twice the number of the petals. The fruit is unknown.

CASSIPOUREA.

This genus must remain restricted to the three tropical American species enumerated in DeCandolle's 'Prodromus.' Additional specimens have proved to me that the *C. serrata* I described among Schomburgk's plants was founded on a specimen of *C. macrophylla* with remarkably toothed leaves, and the *C. quadrilocularis* of Spruce's plants belongs also to the same species, which, as well as the two others, occurs occasionally with four instead of three cells to the ovary. The number of stamens varies in all the species, either four times or five times that of the petals; and in one specimen only of the *C. elliptica*, the one figured in Hooker's 'Icones,' vol. iii. t. 280, does it appear to be generally (but not always?) three times that of the petals.

The genus *Anisophyllum*, Don, or *Tetracarpæa* of Gardner, which I had formerly considered rather as an anomalous *Rhizophoracea* than as a *Hamamelidea*, certainly differs essentially from the former in its alternate leaves, its inflorescence, and more divided styles. Its immediate affinities must, however, remain uncertain until the whole group of small orders clustered round the *Saxifragaceæ* shall have been more carefully reviewed.

The following is the more technical synopsis of the genera and species:—

RHIZOPHORACEARUM tribus 2ª LEGNOTIDEÆ.

Semina albuminosa ante germinationem caduca. Flores quam in *Rhizophoreis* veris vulgo minores. Inflorescentia axillaris, floribus nunc fasciculatis sessilibus v. breviter pedicellatis, nunc in cymas pedunculatas di–tri-chotomas dispositis. Bracteæ ad ramificationes v. ad basin pedicellorum parvæ concavæ, juniores sæpe in cupulam connatæ, per anthesin persistentes v. caducæ. Stamina quæ sepalis opposita in alabastro cum petalis alternant; cætera æstivatione petalis involuta, 1, 2, 3 v. 4 intra quodque petalum. Stigma plus minus peltato-dilatatum (nisi in *Cassipoureis* nonnullis) integrum crenatum v. radiato-lobatum, crenis v. lobis tot quot ovarii loculis.

§ 1. *Ovarii parte ovulifera adnata.*

1. Carallia. Calyx supra ovarium campanulatus, lobis brevibus. Stamina numero petalorum dupla. Ovula gemina. Inflorescentia cymosa.

2. Pellacalyx. Calyx supra ovarium campanulatus, lobis brevibus. Stamina numero petalorum dupla. Ovula fasciculata. Pedicelli fasciculati.

3. Haplopetalum. Calyx usque ad ovarium partitus. Stamina numero petalorum quadrupla (v. quintupla?). Ovula gemina. Pedicelli fasciculati.

§ 2. *Ovarium liberum, lata basi calycis tubo turbinato impositum.*

4. Gynotroches. Stamina numero petalorum dupla. Ovula quaterna. Pedicelli fasciculati.

5. Crossostyles. Stamina numero petalorum quadrupla (v. quintupla?). Ovula gemina. Pedunculi subcymoso-pauciflori. (Discus perigynus lobatus?)

6. Anstrutheria. Stamina numero petalorum quadrupla (v. quintupla?). Ovula gemina. Pedicelli subfasciculati. Discus perigynus integer v. crenulatus.

§ 3. *Ovarium basi minus dilatatum, in fundo calycis campanulati liberum.*

7. Blepharistemma. Stamina numero petalorum dupla. Ovula in ovarii loculis gemina. Inflorescentia cymosa.

8. Dactylopetalum. Stamina numero petalorum dupla. Ovula in placentis ovarii non septati gemina. Pedicelli (brevissimi) fasciculati.

9. CASSIPOUREA. Stamina numero petalorum quadrupla v. quintupla (rarius tripla). Ovula in ovarii loculis gemina. Pedicelli brevissimi fasciculati.

I. CARALLIA, *Roxb.*

Calycis tubus supra ovarium campanulatus, lobis 5–8 brevibus. Discus staminifer usque ad apicem tubi adnatus. Petala tot quot calycis lobi, unguiculata, orbiculata, subserrata v. apice lacera. Stamina numero petalorum dupla, circa disci marginem crenulatum inserta. Ovarii pars ovulifera calyci adnata, 4- (rarius 3- v. 5-) locularis. Ovula in loculis gemina. Fructus abortu sæpius unilocularis, 1-oligospermus. Semen globoso-reniforme, ad hilum impressum. Embryo intra albumen copiosum teres curvatus.—Cymæ pedunculatæ sæpius trichotomæ.

1. C. INTEGERRIMA (*DC. Prod.* iii. p. 33); foliis integerrimis v. versus apicem rarius serrulatis, obovatis ellipticis v. oblongis, floribus 6–8-meris ad ramulos cymarum capitato-sessilibus.—*C. ceylanica, corymbosa* et *sinensis*, Arn. in Tayl. Ann. Nat. Hist. vol. i. p. 371. *C. timorensis*, Bl. Mus. Bot. vol. i. p. 128, ex. char. *C. octopetala*, F. Muell. Pl. Austr. Trop. Occid. *Pootia cereopsifolia*, Miq. Pl. Hochst.

Hab. in Indiæ orientalis sylvis frequens. In ins. Ceylon, *Walker, Gardner*, n. 278; *Kelaart, Thwaites*, n. 1963 et 1964; in Peninsula circa Quilon, *Wight*, n. 2447; in Concan, *Law*; prope Bombay, *Dalzell*; in Terra Canara, *Hochstetter*, n. 307 et 307*a*; in Khasiya, *Griffith*; Sillet, *Hooker* et *Thomson, Wallich Cat.* n. 4880; Sikhim, *Hooker*; in China australi, in ins. Hong Kong, *Champion*; in ins. Philippinis, *Cuming*, n. 1066 et 1027; Mergui et Moolmeyn, *Griffith*; Rangoon, *Maclellan*; (Java et Timor?); in Australia tropica ad Brunswick Bay et York Sound, *Cunningham*; Macadam's Range et Upper Roper River, *F. Mueller*.

Magnopere variat foliorum forma, in speciminibus plerisque Ceylonensibus obovata sunt v. obovali-oblonga obtusissima v. retusa, nonnunquam tamen Indicis omnino similia v. intermedia; in his sæpius ampliora ovali-elliptica obtusa v. plus minus obtuse acuminata, rarius late obovata, v. anguste oblonga; in Sinensibus et præsertim in Philippinensibus pleraque angustiora et longius acuminata, sed in his etiam occurrunt folia Indicis similia; specimina Orientalia et Australasica omnino Indicis similia. Flores etiam magnitudine variant (interdum abortu semi-dioici?). Calyx vulgo circa 2 lin. longus. Cymæ subcorymbosæ ramis brevibus crassis, floribus densius laxiusve depresso-capitatis. Bacca vulgo globosa monosperma, rarius dispermam vidi. Specimina tamen fructifera haud multa vidi.

C. symmetria, Bl. Mus. Bot. vol. i. p. 130, e Java, ex descriptione non differre videtur a speciminibus *C. integerrimæ* foliis apice dentatis.

2. C. CUSPIDATA, *Bl. l. c.* p. 129, e Borneo, ex charactere suo affinis videtur formis angustifoliis *C. integerrimæ*, sed diversa floribus minoribus.

3. C. LANCEÆFOLIA (*Roxb. Fl. Ind.* vol. ii. p. 481; *Wight, Ic.* vol. iii. t. 604); foliis ellipticis oblongisve regulariter serrulatis, floribus 6–8-meris ad ramulos cymarum subcapitato-sessilibus, petalis reniformibus crenulatis.—*C. confinis*, Bl. Mus. Bot. vol. i. p. 129?

Hab. In Sumatra, *Roxburgh*. Specimina quæ vidi omnia ex horto botanico Calcuttensi.

A *C. integerrima* differt imprimis foliis a basi ad apicem regulariter crenulato-serrulatis. Bacca etiam major videtur, turbinato-globosa, 2–3-sperma. Flores iis *C. integerrimæ* similes, minus tamen conferti.

C. lucida, Roxb. Pl. Corom. vol. iii. t. 211, et in Wight, Icon. vol. iii. t. 605 (cujus specimina sicca vidi e horto Calcuttensi) videtur *C. lanceæfoliæ* forma latifolia male depicta.

4. C. CELEBICA (*Bl. Mus. Bot.* vol. i. p. 131, ex charact.); foliis ellipticis oblongisve serrulatis, floribus in cymis trichotomis subpedicellatis, petalis late cordatis fimbriatis.

Hab. (In ins. Celebes, *Blume*), in Labuan, ins. Borneo, *Motley*.

Species bene distincta. Flores 3 lin. longi. Calycis lobi latiusculi tubo breviores. Pedicelli breves et crassi, sed sæpius distincti. Fructus non vidi.

5. C. CALYCINA; foliis ovatis ellipticisve integerrimis, pedunculis longiuscule dichotomis, petalis late cordatis fimbriatis.

Hab. in ins. Ceylon, *Thwaites*, n. 3458.

Ramus adest dichotomus, ad nodos leviter incrassatus. Folia pleraque bipollicaria, breviter acuminata, coriacea. Cymæ quam in *C. celebica* magis elongatæ, pedunculo bis terve bifido, floribus alaribus nullis. Flores fere 4 lin. longi, angustiores quam in *C. celebica*; calycis laciniæ 4, lanceolatæ, crassæ, tubo turbinato sublongiores. Discus parti tubi liberæ brevissime adnatus. Petala lata subreniformia, insigniter fimbriata. Ovarium 4-loculare. Stigma 4-crenatum.—Specimen unicum vidi, floribus paucis, quorum unicum tantum examinavi.

6. C. MULTIFLORA, *Bl. l. c.* p. 131, e Borneo, a me non visa, differre dicitur a *C. celebica* corymbis magis ramosis multifloris, floribus minoribus.

7. C. BARALDEIA, *Arn. in Ann. Nat. Hist.* vol. i. p. 371. Baraldeia, *Dup. Thou. Gen. Nov. Madag.* p. 24, e Madagascaria, quam non vidi, distinguitur imprimis floribus 5-meris, nec ut in præcedentibus 6–8-meris.

Diatoma brachiata, Lour. Fl. Cochinch. p. 296, ab auctoribus verosimiliter haud immerito ad *Caralliam* relata, a *C. integerrima* differre videtur petalis ut in *C. celebica* fimbriatis. Specimina nulla vidi.

II. PELLACALYX, *Korth.*

Calycis tubus supra ovarium campanulatus, lobis 5–6 brevibus. Discus staminifer usque ad apicem tubi adnatus. Petala tot quot calycis lobi, apice lacera. Stamina numero petalorum dupla, circa disci marginem crenulatum inserta. Ovarii pars ovulifera calyci adnata, 5- (rarius 6-?) locularis. Ovula in loculis plurima (8–12) fasciculata. Fructus subglobosus, carnosus, calycis limbo coronatus. Semina parva ovoidea. Embryo in albuminis axi rectus teres, cotyledonibus vix radicula latioribus.—Pedicelli axillares fasciculati.

Species unica.

P. AXILLARIS, *Korth. in Van der Hoeven et De Vriese, Tijdschr.* vol. iii. p. 20. t. 2.

Hab. in ins. Penang, *Phillipps*; in Malacca, *Griffith.*

Folia oblonga acuminata 4–5-pollicaria supra scabriuscula subtus pube stellata rufescentia. Bacca 3–4 lin. diametro, tubo calycis 2½ lin. longo coronata. Dentes breves reflexo-patentes. Semina iis *Gynotrochis* similia v. paullo majora.

III. HAPLOPETALUM, *A. Gray.*

Calyx fere ad ovarium 4-partitus. Petala 4 subsessilia integerrima. Stamina numero petalorum 4-pla (v. 5-pla?) ad marginem disci brevissimi inserta. Ovarii pars ovulifera calyci adnata, 1-locularis. Ovula 8–10 e columna centrali geminatim appensa. Fructus ignotus.—Pedicelli axillares fasciculati.

Species unica.

H. RICHEI, *A. Gray, Bot. Amer. Explor. Exped.* vol. i. p. 608. t. 76.

Hab. in insulis Feejee.

Habitus folia et flores parvi *Gynotrochis axillaris.*

IV. GYNOTROCHES, *Bl.*

Calycis tubus brevissime turbinatus limbus 4–5-partitus. Petala tot quot calycis laciniæ unguiculata apice lacera. Stamina numero petalorum dupla, disco brevissimo crenulato inserta. Ovarium superum, lata basi calyci impositum, 4–6-loculare. Ovula in loculis 4, fasciculata. Bacca ovoideo-globosa, indehiscens. Semina parva, ovoidea. Embryo in albuminis axi rectus teres, cotyledonibus vix radicula latioribus.—Pedicelli ad axillas fasciculati.

1. G. AXILLARIS (*Bl. Mus. Bot.* vol. i. p. 127. t. xxxi.); pedicellis calyce longioribus. *Dryptopetalum coriaceum,* Arn. in Ann. Nat. Hist. vol. i. p. 372. *Microtropis coriacea,* Wall. Cat. n. 4338. *Gynotroches Dryptopetalum,* Bl. Mus. Bot. vol. i. p. 127. *G. reticulata,* A. Gray, Bot. Amer. Explor. Exped. vol. i. p. 607, ex descr.

Hab. in sylvis montanis Archipelagi Indici, *Blume, Seemann*; in ins. Penang et Singapore, *Wall. Cat.* n. 4338 et 8457; in Malacca, *Griffith, Cuming,* n. 2367; ad Moulmeyn, *Lobb.*

Folia oblonga v. elliptica acuminata, 2–5 poll. longa coriacea reticulato-venosa. Flores in axillis numerosi parvi, brevius longiusve pedicellati, calyce circa 1 lin. longo, abortu subdioici; masculi staminibus petalisque perfectis, ovario sæpius tenui vacuo, stigmate haud dilatato; fœmineo-hermaphroditi longius pedicellati, petalis staminibusque sæpe minoribus his interdum effœtis, stigmate radiato-lobato. Bacca 1½–2 lin. diametro pleiosperma.

2. G. MICRANTHA, *Bl. Mus. Bot.* vol. i. p. 128, a me non visa, a præcedente differre dicitur floribus minutissimis subsessilibus.

Hab. in Borneo et Sumatra (*Blume*).

V. CROSSOSTYLES, *Forst.*

Calycis tubus brevissime turbinatus, limbus 4–5-partitus. Petala tot quot calycis laciniæ unguiculata, apice lacera. Stamina numero petalorum quadrupla (v. quintupla?) disco brevissimo inserta; filamenta brevia totidem cum staminibus alternantia (an disci laciniæ? an stamina sterilia?). Ovarium superum basi latissima calyci impositum, 5–12-loculare. Ovula in loculis gemina. Fructus carnosus subglobosus in valvulas septicide tardius dehiscens. Semina ovoidea. Embryo in albuminis axi rectus, radicula tereti, cotyledonibus anguste ovatis.—Pedunculi axillares bi–pluri-flori, floribus pedicellatis.

Petala et filamenta sterilia in sola *C. biflora* observata. Semina in *C. Harveyi*.

1. C. BIFLORA (*Forst.*; *Guillem. Zeph. Tait. in Ann. Sc. Nat. Par.* ser. 2. vol. vii. p. 354; *A. Gray, Bot. Amer. Explor. Exped.* vol. i. p. 610. t. 77); foliis amplis obovatis, gynæcio sub-12-mero.

Hab. in insula Societatis Raietea (*Forster*); in Tutuila insularum Samoa (*Amer. Explor. Exped.*).

Folia 4–7 poll. longa, 2–3 poll. lata. Pedunculi 3–4 lin. longi, pedicellis 2–3 (rarius 4) unifloris v. rarius 3-floris.

2. C. HARVEYI; foliis ovali- v. oblongo-ellipticis, gynæcio 5–7-mero.

Hab. in insulis Feejee, *Harvey*.

Arbor? glabra, ramulis ad nodos incrassatis. Folia petiolata, obtusa, coriacea, 2–2½-pollicaria. Pedunculi 2–3 lin. longi petiolo subbreviores, sæpius ad axillas solitarii biflori. Pedicelli pedunculo subæquales. Bracteæ caducæ. Calycis fructiferi tubus late et brevissime turbinatus, laciniis crassis reflexis 2 lin. longis. Discus in calyce fructifero fere obliteratus. Staminum vestigia supersunt numero laciniarum quadrupla, filamento brevi, antheris oblongis. Capsula baccans circa 4 lin. diametro 5–7-locularis, stylo brevi stigmate 5–7-radiato coronata, maturitate valvulis 5–7 crasso-carnosis dehiscens. Semina axi persistenti appensa, ovoidea, duplo fere majora quam in *Gynotrochi*.

VI. ANSTRUTHERIA, *Gardn.*

Calycis tubus brevissime turbinatus, limbus 4–5-partitus. Petala tot quot calycis laciniæ unguiculata apice lacera. Stamina numero petalorum quadrupla (v. quintupla ?) disco brevissimo inserta; filamentis nullis interjectis. Ovarium superum basi lata calyci impositum, 3- (rarius 4-) loculare. Ovula in loculis gemina. Fructus carnosus subglobosus in valvulas crassas demum septicide dehiscens. Semina ovoidea. Embryo in albuminis axi rectus, cotyledonibus late ovatis.—Pedicelli axillares solitarii v. pauci. Bracteæ quam in *Cassipourea* crassiores, juniores in cupulam connatæ calycem basi amplectentes, demum apertæ v. caducæ.

Species v. formæ tres, patria diversa inter se tamen valde affines, et specimina ad diagnoses conficiendas adhuc non sufficiunt.

1. A. CEYLANICA, *Arn. in Calc. Journ. Nat. Hist.* vol. vi. p. 344. t. 4.
Hab. in ins. Ceylon, *Klein, Walker, Gardner, Champion, Thwaites, &c.*
Folia variant nunc late ovata tenuiora, nunc ovali-elliptica magis coriacea.

2. A. AFRICANA. *Cassipourea africana,* Benth. in Hook. Fl. Nig. p. 341. *C. congoensis,* Br. ex DC. Prod. vol. iii. p. 34 ?.
Hab. in Africa tropica occidentali, *Vogel.*
Specimina fructifera tantum vidi cum alabastris junioribus; simillima sunt iis e Ceylonensium foliis angustis coriaceis donatis, flores tamen multo minores videntur.

3. A. MADAGASCARIENSIS. *Cassipourea madagascariensis,* DC. Prod. vol. iii. p. 34. *Richæia,* Dup. Thou. Gen. Nov. Madag. p. 25.
Hab. in Madagascaria, *Dupetit Thouars.*
Species a me non visa.

VII. BLEPHARISTEMMA, *Wall.*

Calyx ovoideus, breviter 4-lobus. Petala in fundo calycis circa discum inserta, unguiculata, apice lacera. Stamina numero petalorum dupla, disco cupulato apice crenato inserta. Ovarium in fundo calycis liberum obovoideum 3-loculare, ovulis in quoque loculo geminis. Fructus ignotus.—Cymæ pedunculatæ axillares corymboso-multifloræ. Flores abortu subdioici.

Species unica.

B. CORYMBOSUM, *Wall. Cat.* n. 6320. *Dryptopetalum membranaceum,* Miq. in Pl. Hohenack. n. 713.
Hab. In Indiæ Orientalis Peninsula, *Herb. Heyne*; in Terra Canara prope Pellitschery, *Hohenacker.*
Frutex ?, excepta inflorescentia gemmisve novellis glaber. Folia opposita, petiolata, ovali-elliptica v. oblonga acuminata, irregulariter sinuato-

crenata, basi acuta v. rotundata, 4–5 poll. longa, 1½–2½ poll. lata, membranacea, penninervia. Stipulæ interpetiolares lanceolatæ membranaceæ pubescentes, 2–3 lin. longæ, caducissimæ. Cymæ ad axillas v. ad basin innovationum oppositæ, pedunculo semipollicari fultæ, 2–3-chotomæ, floribus 20–30 et ultra. Pedicelli circa lineam longi. Calyx ovoideo-campanulatus, 1½ lin. longus, crassiusculus, superne extus minute hirtellus, lobis vix ad tertiam partem attingentibus. Petala marium calyce duplo longiora. Stamina paullo breviora uti petalorum ungues ciliata. Discus ¾ lin. longus, a calyce fere omnino liber, apice 8-dentatus. Ovarium angustum vacuum stylo brevi. Petala in floribus fœmineis breviora. Stamina minora antheris parvis (effœtis?). Discus minor, sæpe fissus. Ovarium obtuse subtrigonum. Stylus calyce longior, stigmate obsolete trilobo.

VIII. Dactylopetalum, *Benth.*

Calyx campanulatus breviter 5-lobus. Petala in fundo calycis circa discum inserta, unguiculata, apice lacera. Stamina numero petalorum dupla disco cupulato leviter crenato inserta. Ovarium in fundo calycis liberum uniloculare, ovulis 4, per paria circa axin pendulis. Fructus ignotus.—Flores in axillis glomerati subsessiles.

Species unica.

Dactylopetalum sessiliflorum.

Hab. In ins. Nossi-bé, *Boivin.*

Arbor? glabra. Stipulæ breves, caducæ. Folia petiolata oblongo-elliptica, breviter acuminata, integerrima, 3–4-pollicaria, coriacea. Flores ad axillas conferti subsessiles, ut videtur ebracteati. Calyx vix 2 lin. longus, lobis obtusis. Petala paullo longiora, uti stamina glabra, apice in lobos circa 5 digitatim fissa. Discus quam in *Blepharistemmate* brevior. Stigma vix dilatatum.

IX. Cassipourea, *Aubl.*

Calyx campanulatus, breviter 4–5-lobus. Petala in fundo calycis circa discum inserta, unguiculata, apice profunde fimbriato-lacera. Stamina numero petalorum 4–5-pla (rarius tripla), disco cupulato apice vix crenulato inserta. Ovarium in fundo calycis liberum ovoideum v. globosum 3-loculare (rarius 4-loculare), ovulis in quoque loculo geminis. Stigma vix dilatatum. Fructus carnosulus ovoideus in valvulas carnosulas septicide subdehiscens.—Flores in axillis glomerati, sessiles v. breviter pedicellati. Species tres, omnes Americanæ, in Prodromo Candollii enumeratæ, inter se valde affines sunt.

1. C. **elliptica** (*Poir. Dict. Suppl.* vol. ii. p. 131; *Hook. Ic.* vol. iii. t. 280); foliis ovatis ellipticisve integerrimis, floribus distincte pedicellatis.

Hab. in insulis Americæ æquinoctialis; in ins. Jamaica, *Purdie*; Dominica, *Imray*; Sti Vincentii, *Anderson, Guilding*; et in America centrali prope Chagres, *Fendler*, n. 191; in ins. Coyba Novæ Grenadæ, *Seemann*.

Folia vulgo basi magis angustata quam in sequentibus. Calyx 2 lin. longus.

2. C. GUIANENSIS (*Aubl. Pl. Gui.* vol. i. p. 529. t. 211); foliis ovatis ellipticisve integerrimis, floribus subsessilibus.

Hab. in Guiana Anglica, *Hancock, Rob. Schomburgk*, coll. ii. n. 84 et 853; *Rich. Schomburgk*, n. 32 et 1473; in Cayenne, *Martin*; in Surinamo, *Hostmann*, n. 1170.

Folia basi sæpius obtusa, rarius acuta, petiolo brevi nunc brevissimo. Calyx circa 1½ lin. longus.

3. C. MACROPHYLLA (*DC. Prod.* vol. iii. p. 34); foliis ellipticis oblongisve superne hinc inde repando-dentatis, floribus subsessilibus. *C. serrata*, Benth. in Hook. Journ. vol. ii. p. 223, et *C. quadrilocularis*, Benth. in Spruce, Pl. Exs.

Hab. in Guiana Anglica ad flumina Essequebo et Rupununy, *Rob. Schomburgk*, coll. i. n. 527; in Brasilia boreali ad flumina Amazonum et Rio Negro, *Martius, Spruce*.

Folia vulgo 4–6-pollicaria, hinc inde tamen iis *C. guianensis* similia. Flores quam in præcedentibus majores. Calyx 2¼ lin. longus.

Notice of the Re-discovery of the Genus *Asteranthos*, Desf., by Mr. Spruce. By GEORGE BENTHAM, Esq., F.L.S.

[Read April 1st, 1858.]

THE plant, of which I here exhibit a specimen, has excited much interest, as well from its close relationship to the African *Napoleona*, as from the uncertainty of the origin of the only specimen hitherto known. This specimen, or rather fragment, was part of a herbarium brought from Portugal to the Museum of the Jardin des Plantes of Paris in the commencement of the present century, and which contained, together with several plants from the Brazilian provinces of Pernambuco and Rio Negro, others from Angola in Africa. From this fragment, consisting of a branch with two leaves and a few loose flowers, Turpin made up the figure in the 'Annales du Muséum,' and Desfontaines drew up his description. Adrien de Jussieu afterwards dissected one of the loose buds, and as the result showed a great affinity to the *Napoleona* and to no other plant known, it was supposed that the *Asteranthos* also was probably African, but had been misplaced into the Brazilian portion of the above-mentioned herbarium, by some confusion in sorting it, either in Portugal or on its arrival in Paris. Mr. Spruce, however, has now proved that its Brazilian origin was perfectly correct. He found it in great abundance on the banks

of the Guainia, the name given to the Guainiu above its confluence with the Casiquiare, and also on the Atabapo, an affluent of the Orenoco below its junction with the Casiquiare. He describes it as a tree of 30 or 40 feet in height, with slender branches, and handsome, very highly scented, yellow flowers. He found the number of folds of the corolla to vary from 22 to 26; I have counted 28 in some flowers; and in a loose corolla which he found floating very far down the Rio Negro there are 35.

Adrien de Jussieu (Ann. Sc. Nat. iii. 2. p. 227) states that, in the bud he examined, he found a 5-celled ovary with three or four pendulous ovules in each. In the flowers I have examined I find six cells, corresponding to the six raised ribs of the base of the style described by Desfontaines. The four pendulous ovules in each cell are precisely as in *Napoleona*.

There being no fruit with these specimens, they add but little to what was already known as bearing on the much-disputed question of the affinities of these plants. I cannot enter into Jussieu's views of their proximity to *Sapotaceæ*; but it appears to me that everything confirms Lindley's views of their affinity with *Myrtaceæ*. Indeed if we include in that family the *Barringtonieæ* and *Lecythideæ*, we can scarcely exclude *Asteranthos*. The tendency to the union of the petals and stamens in concentric rings may be traced in several plants of the group.

Monograph of the *Eucalypti* of Tropical Australia; with an Arrangement for the use of Colonists according to the Structure of the Bark*. By Dr. FERDINAND MUELLER, Government Botanist, Victoria, Australia. Communicated by Dr. J. D. HOOKER, V.P.R.S., F.L.S.

[Read February 18, 1858.]

CONSPECTUS EUCALYPTORUM AUSTRALIÆ INTERTROPICÆ ET SUBTROPICÆ.

I. *Folia alterna, latitudine conspicue longiora.*

§ 1. *Valvæ prorsus exsertæ.*

1. *E. tereticornis.* Operculum conico-subulatum.
2. *E. rostrata.* Operculum hemisphæricum, rostratum.
3. *E. brevifolia.* Operculum hemisphæricum, muticum.

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* The accompanying MS. has been compared with the specimens from Dr. Mueller and A. Cunningham in the Hookerian Herbarium, by Mr. Allan Black, Curator of the Herbarium, who has added some habitats and notes.—J. D. H.

4. *E. patellaris.* Operculum patellare, umbonatum.
5. *E. exserta.* Operculum conicum, obtusum.

§ 2. *Valvæ semiexsertæ.*

6. *E. signata.* Operculum hemisphæricum; fructus semiglobosus.
7. *E. hemilampra.* Operculum elongato-conicum; fructus turbinatus.
8. *E. semicorticata.* Operculum acuminatum; fructus semiglobosus.
9. *E. leptophleba.* Operculum ...... ; fructus semiovatus.
10. *E. microtheca.* Operculum ...... ; fructus minutus, semiovatus.
11. *E. fibrosa.* Operculum tenui-conicum; fructus semiglobosus.
12. *E. crebra.* Operculum semiovatum; fructus semiovatus.

§ 3. *Valvæ omnino inclusæ.*

13. *E. variegata.* Operculum hemisphæricum; fructus semiovatus.
14. *E. tessellaris.* Operculum patellare; fructus semiovatus.
15. *E. polycarpa.* Operculum ...... ; fructus oblongo-ovatus.
16. *E. terminalis.* Operculum ...... ; fructus subcampanulatus.
17. *E. dichromophloia.* Operculum semiovatum; fructus urceolatus.
18. *E. trachyphloia.* Operculum ...... ; fructus semiovatus.
19. *E. bicolor.* Operculum hemisphæricum, ecostatum; fructus semiovatus.
20. *E. ptychocarpa.* Operculum hemisphæricum, costatum; fructus subcampanulatus.
21. *E. aurantiaca.* Operculum hemisphæricum, costatum; fructus urceolari-campanulatus.
22. *E. phœnicea.* Operculum ...... ; fructus urceolaris, ecostatus.

§ 4. *Species fructu ignoto.*

23. *E. citriodora.* Operculum hemisphæricum?
24. *E. tectifica.* Operculum acuminatum.

II. *Folia alterna, latitudine vix aut paulo longiora.*

25. *E. populnea.*

III. *Folia opposita vel subopposita, latitudine vix aut paulo longiora.*

§ 1. *Valvæ prorsus exsertæ.*

26. *E. platyphylla.*

§ 2. *Valvæ semiexsertæ.*

27. *E. melanophloia.*

§ 3. *Valvæ omnino inclusæ.*

28. *E. latifolia.* Operculum ...... ; fructus subcampanulatus.
29. *E. aspera.* Operculum ...... ; fructus minuti, subcampanulati.
30. *E. ferruginea.* Operculum ...... ; fructus globoso-ovati.
31. *E. melissiodora.* Operculum conico-hemisphæricum; fructus campanulati.

§ 4. *Species fructu incognito.*

32. *E. bigalerita.* Operculum duplex.
33. *E. floribunda.* Operculum patellare.

IV. *Folia opposita, latitudine conspicue longiora.*

34. *E. tetrodonta.*

V. *Sectio dubia.*

35. *E. brachyandra.*
36. *E. clavigera,* A. Cunn.
37. *E. odontocarpa.*
38. *E. pachyphylla.*

I. *Folia alterna, latitudine conspicue longiora.*

§ 1. *Valvæ prorsus exsertæ.*

1. EUCALYPTUS TERETICORNIS (*Smith in Trans. Linn. Soc.* iii. 284). E. subulata (*All. Cunn. ex Schauer in Walp. Rep. Bot. Syst.* ii. 924). Excelsa, ramulis tenuibus teretiusculis, foliis alternis longiuscule petiolatis elongato-lanceolatis subfalcatis concoloribus vix nitidulis pellucide punctatis penniveniis, vena longitudinali a margine remota, umbellis 4–6-floris, pedunculis axillaribus lateralibusque solitariis pedicellos longitudine excedentibus angulosis, calycis ecostati *operculo conico-subulato subcurvato* tubi hemisphærici longitudinem pluries excedente, *capsulæ* semisuperæ subglobosæ quadriloculatæ *valvis alte exsertis* deltoideis, seminibus apteris.

Hab. In montosis planitiebusque Australiæ orientalis usque ad flumen Burdekin. Anth. vere. (Brisbane River, *Frazer,* in hb. Hook.)

Arbor trunco utplurimum recto, cortice undique cinereo lævi in stratis tenuibus fuscescentibus secedente. *Folia* longitudine inter 3 et 7″ varia, inferne 6–10‴ lata, in apicem longe sensimque angustata, breviter in petiolum decurrentia. *Calycis* tubus 1‴ parum excedens. *Filamenta* albida. *Operculum* pallidum circiter semunciale. *Capsula* ad $\frac{2}{3}$ exserta, fere 3‴ metiens.

Huic *E. rostrata,* Schlecht. et *E. acuminata,* Hook. proximæ, et forsan nonnisi varietatis valore diversæ.

2. EUCALYPTUS ROSTRATA (*Schlechtendal*! *in Linnæa,* xx. p. 655. E. acuminata, *Hook.*! *in Mitchell, Trop. Austral.* p. 390). Arborea, ramulis tenuibus apice angulatis, foliis alternis modice petiolatis elongato- vel falcato-lanceolatis opacis prominenter penniveniis pellucide punctatis, vena peripherica a margine remota, umbellis axillaribus solitariis 5–7-floris, pedicellis calycis tubo subduplo longioribus pedunculo conspicue brevioribus quocum tenuibus angulatis, calycis tubo hemisphærico ecostato, *operculo semigloboso conico- vel subulato-acuminato,* fructibus quadriloculatis, *valvis omnino exsertis,* seminibus apteris.

Hab. In Australia tropica et subtropica secus rivulos, circum paludes lacusque, nec minus in pratis tempore pluviali inundatis fere ubique abunde occurrens. Anth. æstate.

Arbor mediocris vel gigantea, ramulis pendulis. *Cortex* præter trunci basin cæsio- vel albido-cinereus lævis rudimentis strati superi fuscescentis secedentis tenuibus interdum parce obtectus. *Folia* tenui-coriacea, pleraque 5–8″ longa, inferne 6–10‴ lata, in apicem longe angustata. *Calycis* tubus sesquilinearis. *Operculi* acumen longitudine et forma varians sed potius subito quam (in *E. tereticorni*) sensim protrudens. *Stamina* albida. *Capsula* circiter 3‴ metiens.

Adnot. Operculi acumen nonnunquam rudimento operculi alteri inclusum.

"Yarra-tree," *Mitch. Trop. Austr.* passim. "Flooded Gum-tree," *Leichhardt's Overland Exp.* et colonorum passim. "Red Gum-tree" inhabitantium coloniæ South Australia.

3. Eucalyptus brevifolia. Arborea v. fruticosa, ramulis teretiusculis, foliis alternis angusto- vel ovato-lanceolatis parum curvatis acutis vel sensim acuminatis modice petiolatis subtiliter penniveniis epunctatis, vena peripherica a margine vix remota, umbellis axillaribus paucifloris, pedunculis petiolo brevioribus obscure angulatis, calycis tubo semiovato vel hemisphærico lævi pedicellum duplo excedente operculi semiglobosi mutici longitudinem vix superante, *capsula semiexserta* 3- raro 4-loculata vertice hemisphærica stylo mucronata, valvis paulo infra marginem insertis, seminibus clathratis apteris.

Hab. In eremis terræ tabularis ad flumina Victoria et Sturt's Creek, in plaga Arnheim's Land et circum sinum Carpentaria. Anth. vere.

Frutex elatior vel arbor minor rarius mediocris, cortice lævi albido-cinerascenti. *Ramuli* fulvi. *Folia* pleraque 2–3″ longa, ½–1″ lata. *Pedunculi* 3–4‴ longi. *Calycis* tubus longitudine 1½–3‴ varians, fructifer hemisphæricus. *Semina* ⅔–1‴ longa ovata concavo-convexa fusca.

Variat floribus duplo minoribus.

4. Eucalyptus patellaris. Arborea, ramulis teretiusculis apice vix angulatis, foliis alternis modice petiolatis angusto-lanceolatis subfalcatis longe acutatis parce pellucide punctatis nitidulis subtiliter venosis, vena peripherica margini subcontigua, umbellis terminalibus axillaribusque 3–7-floris geminis vel pluribus paniculatis, pedunculo teretiusculo pedicellis angulatis paulo vel duplo longiore, *calycis tubo campanulato* pedicellum longitudine æquante *operculum patellare umbonatum* duplo excedente, capsulæ quadriloculatæ *valvis prorsus exsertis.*

Hab. Ad rivulos exsiccantes fluvii Roper. Anth. æstate.

Arbor elatior, habitu *E. microthecæ.* *Cortex* sordide canus rugosus et rimulosus in trunco ramisque persistens. *Folia* 3–6″ longa, ½–1″ lata. *Pedunculi* unciales vel breviores. *Calycis* tubus circiter 4‴

longus viridulus. *Operculum* fuscescens coriaceum. *Valvæ* margini calycis adnatæ.

5. **Eucalyptus exserta.** Arborea, ramulis tenuibus angulatis, foliis alternis angusto-lanceolatis elongatis leniter curvatis modice petiolatis acuminatis opacis pellucide punctatis subtilissime penniveniis, vena peripherica a margine remota, umbellis axillaribus lateralibusque solitariis 3–7-floris, petiolo pedunculum angulatum superante, calyce breviter pedicellato, *operculo conico* obtusiusculo calycis tubum hemisphæricum indistincte costatum duplo excedente, *capsula globosa* 3–5-loculata *semisupera, valvis alte exsertis,* seminibus apteris.

Hab. In pratis minus fertilibus ad fluvium Burnett. Anth. Jan., Febr.

Arbor mediocris vel minor, cortice in trunco ramisque persistente cinereofusco rugoso et rimoso, extus frustuloso, intus subfibroso. *Folia* 3–6″ longa, 4–8‴ lata. *Pedunculi* 3–5‴ longi. *Capsula* circiter 3‴ metiens, valvis brevibus deltoideis supra calycis marginem orientibus. *Fructus* igitur non dissimilis ei *E. rostratæ.* *Semina* angulata subtilissime rugulosa fertilia nigrescentia.

Quoad corticis structuram inter arbores Eucalyptorum "Bloodwood-" et "Stringy-bark-trees" vocatas quasi medium tenet, notis specificis ad *E. fibrosam* approximans.

§ 2. *Valvæ semiexsertæ.*

6. **Eucalyptus signata.** Arborea, ramulis apice angulatis, foliis alternis elongato-lanceolatis falcatis modice petiolatis longe acuminatis opacis prominenter venosis pellucide punctatis, *venis erecto-patentibus*: peripherica a margine remota, umbellis axillaribus et lateralibus 6–10-floris, pedicellis angulatis pedunculo compresso bis terve brevioribus calycem ecostatum vix excedentibus, calycis tubo operculum hemisphæricum apiculatum longitudine duplo superante turbinato, *fructibus parvis hemisphæricis* quadriloculatis vertice planis, valvis vix exsertis, seminibus apteris.

Hab. In collibus et montibus graminosis sylvaticis ad flumen Brisbane. (*Macarthur*, Sydney Woods, Paris Exhib. No. 163, in hb. Hook.) Anth. Nov., Dec.

Arbor elata, "Spotted Gum-tree" in plagis ad Moreton Bay vocata, *trunco* cum ramis lævi e cæsio et albido vel livido *variegato* lineisque flexuosis signato. *Folia* 3–6″ longa, ⅔–1⅓″ lata venis angulo acutiore patentibus percursa. *Pedunculi* 5–9‴ longi. *Stamina* albida ad 2‴ longa. *Operculum* circiter 1‴ altum, interdum obtusum raro acuminatum. *Fructus* circiter 2½‴ longi.

7. **Eucalyptus hemilampra.** Arborea, ramulis compresso-tetragonis, *foliis* alternis modice petiolatis curvato-lanceolatis sensim acuminatis pellucide punctatis subtilissime venosis *supra nitentibus, subtus pallidioribus opacis,* vena longitudinali a margine remotiuscula, umbellis 5–7-floris axillaribus lateralibusque solitariis, pedunculo compresso petiolum æquante pedicellis angulosis longiore, calycis

tubo late obconico paucicostato, *operculo elongato-conico* acuto *recto* tubi longitudinem ter quaterve excedente ecostato, fructibus subturbinatis quinqueloculatis vertice convexis, valvis semiexsertis, seminibus apteris.

Hab. Ad rivulos torrentesque sylvaticos secus partes fluvii Brisbane superiores. Anth. Dec., Jan.

Arbor procera, trunco ramisque cinereis lævibus. *Folia* 4–5 poll. longa, inferne $\frac{3}{4}$–$1\frac{1}{3}''$ lata. *Pedunculi* $\frac{1}{2}$–$1''$ longi. *Pedicelli* calycis tubo modo longiores modo breviores. *Operculum* semunciale sordide flavidum. *Filamenta* albida ad $\frac{1}{2}''$ longa. *Fructus* vix $3'''$ longi apice non contracti.

E. tereticorni similis, foliis quoque *E. citriodoræ.*

8. EUCALYPTUS SEMICORTICATA. Arborea, ramulis angulatis, foliis alternis lanceolatis subfalcatis modice petiolatis sensim acuminatis opacis subtilissime venosis imperforatis, vena peripherica a margine remota, umbellis axillaribus et lateralibus solitariis 5–8-floris, pedicellis angulatis pedunculo compresso bis terve brevioribus calycis tubo vix longioribus, operculo acuminato calycis tubum semiovatum ecostatum æquante, fructibus hemisphæricis 3–4-loculatis vertice planis, valvis brevissime exsertis, seminibus apteris.

Hab. In nemoribus montium fertiliorum ad flumen Brisbane. (Illawarra, *Macarthur*, Sydney Woods, in Paris Exhib. No. 88, hb. Hook.) Anth. æstate.

Arbor procera, "Blackbut" colonorum. *Cortice trunci* extus *nigrocinereo* intus fusco fibroso, *ramis* denudatis *albidis lævibus*. *Folia* $2\frac{1}{2}$–$4''$ longa, 7–$10'''$ lata. *Pedunculi* 6–$10'''$ longi. *Operculum* $2'''$ longum semiovatum subrostratum. *Fructus* 3–$4'''$ longi. *Semina* fusca $1'''$ longa angulata subtilissime punctulato-rugulosa.

E. persicifolia, Lodd. non Schl., huc forsan pertinet ex nomine vernaculari "Blackbut" ad hanc a Cunninghamio citato.

9. EUCALYPTUS LEPTOPHLEBA. Arborea, ramulis inferne teretiusculis superne angulatis lævibus, foliis alternis modice petiolatis falcato-lanceolatis epunctatis subtilissime venosis, vena peripherica a margine parum remota, umbellis axillaribus terminalibusque 3–5-floris geminis ternis vel paniculatis, pedunculis angulatis; generali cæteris longiore, pedicellis calycis tubo semiovato brevioribus, *fructibus semiovatis ecostatis* 4–5-loculatis, *valvis subinclusis* deltoideis acuminatis infra marginem insertis.

Hab. In pratis ad flumen Gilbert. Anth. æstate.

Arbor mediocris vel major, cortice sordide cano rugoso et rimuloso in trunco ramisque persistente. *Folia* pleraque 3–$5''$ longa, ad $1''$ lata. *Pedunculi* primarii petiolos æquantes vel superantes. *Pedicelli* calycis tubo varie breviores. *Fructus* 3–$4'''$ longi ore non contracti. *Valvæ* non nisi apice exsertæ.

E. patellari approximanda.

10. **Eucalyptus microtheca.** Arborea, ramulis tenuibus teretiusculis, foliis alternis breviuscule petiolatis lineari-lanceolatis subfalcatis acutiusculis opacis imperforatis subtilissime venosis, vena longitudinali margini subcontigua, umbellis axillaribus solitariis vel paniculatis paucifloris, pedunculis angulatis, fructibus parvis semiovatis ecostatis breviter pedicellatis 3–4-locularibus, valvis infra marginem insertis vix emergentibus, seminibus fertilibus nigrescentibus lævibus apteris.

Hab. In Nova Hollandia tropica non rara, planities fertiliores inhabitans. Anth. vere.

Arbor mediocris, *cortice* sordide fusco-cano *rugoso* et rimoso in *trunco persistente, ramis* superne *decorticantibus* cinereis *lævibus. Folia* satis tenuia 2–5″ longa, 4–8‴ lata. *Paniculæ* simpliciusculæ foliis breviores. *Pedunculi* longitudine variantes. *Fructus* 1½–2‴ longi. *Semina* fere ⅔‴ longa peltato- vel truncato-ovata.

11. **Eucalyptus fibrosa.** Arborea, ramulis compresso-tetragonis, foliis alternis modice petiolatis lanceolato-falcatis acuminatis indistincte vel subtile venosis opacis imperforatis, vena peripherica a margine remota, umbellis axillaribus solitariis geminisque vel terminalibus paniculatis 5–6-floris, pedunculo anguloso petiolum vix æquante, pedicellis calycis tubo semiovato æquilongis, *operculo tenui-conico* obtusiusculo *quam tubus angustiore* et duplo longiore, fructibus hemisphæricis 3–4-loculatis ecostatis, valvis infra marginem affixis breviter exsertis, seminibus apteris.

Hab. In montibus nemorosis ad flumen Brisbane. Anth. æstate.

Arbor magna, suo tractu "Stringy-bark-tree" colonis vocata, trunco recto cum ramis corticem extus rugosum nigrescenti-cinereum intus fibrosum gerente. *Folia* 3–5″ longa, ½–1″ lata. *Calyx* in pedicellum angulatum desinens. *Operculum* 3‴ longum. *Fructus* lignosi 3–4‴ longi.

12. **Eucalyptus crebra.** Arborea, ramulis teretiusculis apice angulatis, foliis alternis modice petiolatis lanceolato-falcatis acuminatis tenuissime vel indistincte penniveniis imperforatis opacis, vena peripherica a margine remotiuscula, umbellis axillaribus solitariis et terminalibus subpaniculatis 3–6-floris, pedunculis petiolum subæquantibus vel eodem brevioribus pedicellisque angulatis, calycis tubo semiovato ecostato pedicellum longitudine subæquante, *operculo* (juvenili) *semiovato* mutico *tubo* vix æquilongo *angustiore*, fructibus parvis semiovatis 3–4-loculatis, valvis parum convexis paulo infra marginem insertis breviter emergentibus, seminibus apteris.

Hab. A montibus Newcastle-Range usque ad sinum Moreton Bay tam in solo fertiliore quam steriliore præcipue autem montano vel collino sylvas vastas apertas constituens. Anth. æstate.

Arbor minor vel mediocris, *cortice undique persistente rugoso nigrito. Folia* 2–5″ longa, 6–9‴ lata, in petiolum ½–1″ longum angustata. *Fructus* 2–2½‴ longi, orificio non contracti.

"Moreton Bay Ironbark-tree" apud colonos nuncupata.

§ 3. *Valvæ omnino inclusæ.*

13. Eucalyptus variegata. Arborea, ramulis angulatis, foliis alternis modice petiolatis lanceolato-linearibus vel angusto-lanceolatis falcatis elongatis longe acutatis nitidulis crebre penniveniis pellucide punctatis, vena peripherica margini valde approximata, *umbellis paniculatis trifloris,* calycis tubo semiovato operculi hemisphærici longitudinem duplo excedente quocum ecostato, fructibus truncato-ovatis triloculatis pedicello bis–quater longioribus ecostatis vertice planis, valvis inclusis, seminibus apteris.

Hab. In collibus graminosis ad flumen Burnett. Anth. æstate.

Arbor altior, trunco lævi cinereo-albido rudimentis strati extimi corticis cæsiis vel sordide rufescentibus variegato. *Folia* pleraque 4–7″ longa et totidem lineas lata. *Pedunculi* partiales 2–3‴ longi angulati. *Alabastra* ovata. *Fructus* 5–6‴ longi apice sensim contracti.

"Spotted Gum-tree" quorundam colonorum. Habitu vix differt ab *E. tereticorni* et *E. rostrata* nisi trunco stratis extimis corticis basi tenus denudato, nec ad basin stratis corticis vetustis lignescentibus rugosis rimosisque obducto.

14. Eucalyptus tessellaris. Arborea, ramulis inferne teretiusculis superne angulatis lævibus, foliis alternis breviuscule petiolatis angusto-lanceolatis subfalcatis subtiliter penniveniis imperforatis, umbellis axillaribus et terminalibus geminis pluribusve paniculatis 2–4-floris, pedunculis angulatis; generali cæteris longiore, alabastris ovatis pedicello fere duplo longioribus, operculo patellari obtuso, tubo operculi latitudinem paulo et longitudinem multo excedente, fructibus truncato-ovatis ecostatis, valvis inclusis.

Hab. In graminosis tam collium quam planitierum præsertim arenoso-argillaceorum a parte austro-orientali sinus Carpentaria usque ad sinum Moreton Bay. Anth. Nov., Dec.

Arbor mediocris vel major, *cortice in parte inferiore trunci* tantum *persistente* solido squalide cinereo rimis longitudinalibus transversisque numerosis inæqualiter *subtessellato* frustula separabilia formante. Pars trunci superior cum ramis albida lævis. *Ramuli* cum foliis ut in plerisque speciebus penduli. *Folia* pleraque 3–4″ longa, $\frac{1}{2}$–$\frac{3}{4}$″ lata acuminata. *Pedunculi* primarii petiolo parum vel duplo breviores. *Fructus* 4–5‴ longi, apicem versus leniter contracti.

"Moreton Bay Ash," *Leichhardt's Overland Expedition* passim et colonorum.

15. Eucalyptus polycarpa. Arborea, ramulis teretiusculis rigidulis, foliis alternis vel suboppositis breviuscule petiolatis elongato- vel falcato-lanceolatis longe in apicem acutatis nitidulis imperforatis *creberrime et subtilissime penniveniis* subtus parum pallidioribus, vena peripherica margini subcontigua, *umbellis* terminalibus *ample paniculatis* 4–6-floris, pedunculis partialibus pedicellorum longitudinem parum vel duplo excedentibus quibuscum teretibus, fructibus oblongo-ovatis

truncatis exangulatis ecostatis antice sensim contractis basi obtusis 3–4-loculatis pedicello aliquoties longioribus, *valvis profunde inclusis, seminibus antice longe alatis.*

Hab. In locis apricis Novæ Hollandiæ intratropicæ passim. Anth. vere.

Arbor mediocris, cortice ubique persistente, extus sordide cano rugoso et rimoso, intus fuscescente, in frustulis separabili. *Folia* 3–5″ longa, inferne 7–9‴ lata crassiuscule coriacea basi in petiolum semuncialem vel breviorem acutata, apice sæpe in acumen angustum producta. *Pedunculi* generales crassi. *Fructus* cano-viriduli opaci non lævigati, 6–8‴ longi, interdum unciales, ore vix dilatati. *Valvæ* deltoideæ acuminatæ.

E. terminali habitu et cortice persimilis, sed fructibus parum vel duplo minoribus et notis expositis diversa.

16. EUCALYPTUS TERMINALIS. Arborea, ramulis teretiusculis rigidis, foliis alternis crassiusculis falcato-lanceolatis acuminatis opacis subtilissime penniveniis imperforatis concoloribus modice petiolatis, vena peripherica margini contigua obscura, *umbellis* 3–6-floris *in paniculas amplas terminales congestis,* pedunculis partialibus pedicellos longitudine parum excedentibus quibuscum teretibus, fructibus magnis truncato-ovatis subcampanulatis exangulatis ecostatis quadriloculatis vertice planis pedicello fere duplo longioribus, valvis marginem subattingentibus, *seminibus antice longe alatis.*

Hab. In pratis et planitiebus siccis fertilioribus Australiæ intratropicæ non rara. Anth. æstate.

Arbor mediocris vel magna, cortice sordide fusco persistente rugoso rimosoque intus fulvo vel ferrugineo in frustulis irregularibus vix parce secedente. *Folia* utplurimum 5–7″ longa, inferne circiter pollicaria vel paulo angustiora. *Fructus* unciam paulo excedentes antice vix contracti.

17. EUCALYPTUS DICHROMOPHLOIA. Arborea, ramulis subteretibus, foliis alternis modice petiolatis crassiusculis falcato- vel elongato-lanceolatis in acumen longe acutatis vix nitidulis subtilissime venosis imperforatis, umbellis paniculatis 5–7-floris, vena peripherica margini contigua, pedunculis partialibus angulatis pedicello longioribus, alabastris ovatis pedicello æquilongis, tubo operculi mutici hemisphærici longitudinem paulo excedente, *fructibus urceolato-ovatis* vel subglobosis ecostatis quadriloculatis, valvis profunde inclusis deltoideis, *seminibus* fertilibus apice *alatis.*

Hab. In locis minus fertilibus sterilibusve Australiæ intratropicæ passim. Anth. Apr., Mai.

Arbor mediocris vel major. *Corticis stratum superum subpapyraceum læve cinereum* rumpens et tarde secedens ab interiore rufo. *Folia* 3–8″ longa, 6–12‴ lata. *Pedunculi* 4–8‴ longi. *Pedicelli* angulati. *Flores* nondum aperti 3‴ longi. *Fructus* 4–6‴ longi antice leniter contracti; *capsula* a calyce demum secedens.

18. **Eucalyptus trachyphloia.** Arborea, ramulis angulatis, foliis alternis modice petiolatis angusto-lanceolatis subfalcatis in acumen tenue angustatis opacis subtilissime venosis pellucide punctatis, vena longitudinali margini subcontigua, umbellis paniculatis 3–5-floris, pedicellis pedunculo brevioribus fructu æquilongis angulatis, *fructibus* parvis ecostatis *truncato-ovatis* 3-*loculatis, valvis* deltoideis *profunde inclusis,* seminibus apteris.

Hab. In collibus ad flumen Burnett. Anth. Sept., Oct.

Arbor mediocris, cortice in trunco ramisque persistente cinereo-fusco frustuloso rugoso. *Folia* 3–5″ longa, 5–8‴ lata, in petiolum 6–9‴ longum paulo angustata, subtus parum pallidiora. *Fructus* circiter 3‴ metientes apice sensim contracti.

19. **Eucalyptus bicolor** (*A. Cunn. in Mitchell, Trop. Austr.* p. 390. E. parviflora, *Muell. MSS.*). Fruticosa vel arborea, ramulis teretiusculis, foliis alternis lanceolato-linearibus v. lanceolatis leniter curvatis vel falcatis sensim acutatis subtiliter penniveniis nitidulis pellucide punctatis, vena peripherica a margine parum remota, umbellis axillaribus terminalibusque solitariis v. paniculatis 5–7-floris, pedunculis partialibus petiolo vix æquilongis, pedicellis calycis tubo semiovato ecostato æquilongis vel brevioribus, operculo hemisphærico v. semiovato mutico tubo perparum breviore, *capsulis minutis* semiovatis obscure bicostatis apice vix contractis 3–4-loculatis vertice planiusculis, valvis infra marginem insertis inclusis, seminibus apteris.

Hab. In planitiebus collibusque sterilibus a sinu Carpentaria usque ad regiones orientales Australiæ extratropicas. Anth. autumno.

Frutex vel *arbor* minor, cortice sordide cano rugoso in trunco ramisque vestitus. *Folia* petiolo semunciali vel paulo longiore prædita, utplurimum 2½–4½″ longa, 3–6 lineas lata basi acuta. *Calycis* tubus sesquilinearis. *Filamenta* alba ad 1½″ longa. *Antheræ* subglobosæ. *Stylus* staminibus paulo brevior. *Stigma* hemisphæricum. *Capsula* 2–2½‴ metiens. *Semina* fertilia ½–⅔‴ longa nigrescentia angulato-ovata subtilissime rugulosa.

"Scrub Box-tree" peregrinatorum, locos minus fertiles quam *E. microtheca* occupans, absque foliis nitentibus et ramis omnino corticatis jam ex longinquo distinguenda. Arctius ad *E. populneam* approximat. Anth. autumno.

Huic quoque *E. gracilis* et *E. Hookeri* (*E. viminalis,* Hook. in Mitch. Trop. Austr., non Labill.) affines*.

20. **Eucalyptus ptychocarpa.** Arborea, ramulis angulatis, *foliis magnis* crassis alternis oblique lanceolatis tenui-acuminatis modice

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* Major Mitchell's specimens have black bark, and rather large pedicelled flowers. Mueller's, from Burdekin River, have also black bark and small sessile flowers; those from Carpentaria have pale yellow bark, very narrow leaves, and pedicelled capsules.—(A. B.)

petiolatis supra subnitentibus *subtus pallidioribus* penniveniis marginatis imperforatis, vena peripherica margini contigua, umbellis terminalibus paniculatis pauci-septemfloris, pedunculis partialibus pedicellos angulatos duplo triplove excedentibus, *calyce alte octocostato*, operculo hemisphærico tubo bis terve breviore, capsulis magnis ovato-campanulatis alte octocostatis quadriloculatis, valvis profunde inclusis, seminibus fertilibus superne longe alatis.

Hab. Ad rivulos rupestres necnon secus amnes exsiccantes versus originem fluviorum Wentworth, Wickham et Limmen Bight River. Anth. Mart., April.

Arbor media vel major, cortice squalide cano rugoso intus paulo fibroso, undique persistente. *Folia* 5–7″ longa, 1½–2″ lata. *Capsula* 1–1½″ longa antice paululum contracta, valvis brevibus. *Semina* 2‴ longa (*i. e.* fertilia) alam membranaceam obovatam 3‴ longam gerentia; sterilia numerosa diminuta angusto-alata.

Stirps corticis structura medium tenet inter species vernacule "Stringy-bark-trees" et "Box-trees" vocatas.

21. EUCALYPTUS AURANTIACA. Arborea, *ramulis* teretiusculis cum umbellis *pruinoso-albicantibus,* foliis alternis oblique lanceolatis vel subfalcatis opacis modice petiolatis subtiliter venulosis parce pellucide punctatis, vena peripherica margini subcontigua, umbellis axillaribus lateralibusque solitariis 6–7-floris, *pedunculo* petiolum superante *crasso* subcompresso vel teretiusculo, calycibus sessilibus costatis: tubo turbinato operculi semiglobosi longitudinem dimidio excedente, *fructibus magnis ovato-urceolatis alte octocostatis* inter costas plicatis vel costa tenuiore præditis tri-quadri-loculatis, valvis inclusis brevibus.

Hab. In planitiebus arenosis sicuti in plagis elevatioribus petræis circum sinum Carpentaria, ubi vegetationis ornamentum. Anth. Mai.-Aug.

Arbor major vel mediocris. *Cortex* extus sordide fulvido-canus, *friabilis* facile separandus, *lamellaris,* fibris lignescentibus copiosius intertextus, in trunco tantum persistens. *Rami* validi decorticatione albentes. *Folia* 3–4″ longa, ¾–1″ lata. *Calycis* tubus circiter semuncialis. *Staminum filamenta* ad ½″ longa *aurantiaca*! *Antheræ* flavæ ovales. *Stylus* viridis stamina æquans. *Capsula* uncialis vel paulo longior sub ore leniter contracta.

Species pulcherrima *E. phœniceæ* cognata, cujus altitudinem sæpe excedit.

22. EUCALYPTUS PHŒNICEA. Arborea, ramulis fulvescentibus apice angulatis, foliis alternis breviuscule petiolatis tenui-coriaceis oblique lineari-lanceolatis vel subfalcatis opacis parce pellucide punctatis, vena peripherica margini fere contigua, *umbellis* axillaribus et lateralibus pluri-*multifloris,* pedunculo valido pedicellis pluries longiore teretiusculo, calycis tubo fere obconico ecostato, *fructibus* majusculis vix lignescentibus ovato- vel ellipsoideo-*urceolatis* nervosis sub limbo constrictis pedicello pluries longioribus, valvis profunde inclusis.

Hab. In planitiebus elevatioribus collibusque saxosis vel arenosis a fluvio Victoria per terram Arnheim circum sinum Carpentaria. Anth. Jun.–Sept.

Arbor minor vel mediocris. *Cortex* in trunco ramisque persistens, tarde a ramorum parte superiore secedens, extus squalide fulvus, *lamellaris*, fibris lignosis parcius intertextus, *friabilis* et facile separabilis. *Folia* subchartacea 2½–4″ longa, inferne 5–9‴ lata in acumen tenue elongatum terminata. *Stamina phœnicea* vel aurantiaca. *Fructus* uncialis vel paulo longior.

Species formosa *E. miniatæ* affinis cum *E. aurantiaca* et *E. melissiodora* ob corticem micaceo-lamellosum in genere paradoxa.

§ 4. *Species fructu ignoto.*

23. EUCALYPTUS CITRIODORA (*Hook. in Mitch. Trop. Austr.* p. 235). Arborea, ramulis apice angulatis, foliis alternis modice petiolatis elongato-lanceolatis leviter curvatis sensim longe acutatis subopacis pellucide punctatis tenuissime penniveniis, vena peripherica a margine paulo remota, *umbellis* terminalibus et axillaribus mox lateralibus simpliciter *paniculatis trifloris*, pedunculis angulatis, alabastris late ovatis apiculatis, tubo operculi longitudinem saltem duplo excedente, ...

Hab. In vicinia portus Curtis, *C. Moore.* Anth. autumno.

Arbor elatior, cortice cinereo lævi. *Ramuli* sordide rubelli. *Petioli* compressi obscure canaliculati vix 1″ longi. *Folia* 3–8″ longa, ⅔–1½″ lata tenui-coriacea in petiolum paulo decurrentia saturatius quam plurimorum congenerum viridia concoloria, *odore insigni citreo*! *Paniculæ* foliis breviores ex umbellis paucis constantes. *Bracteæ* et *bracteolæ* valde caducæ; illæ ad basin pedunculorum partialium solitariæ ovato-cymbiformes acutæ 1½‴ longæ; hæ vix 1‴ longæ ovales concavæ acutæ.

24. EUCALYPTUS TECTIFICA. Arborea, ramulis tenuibus teretiusculis, foliis alternis tenui-coriaceis breviuscule petiolatis ovato- vel angusto-lanceolatis antice longe acutatis tenui-venosis opacis imperforatis, vena longitudinali ad marginem valde approximata, umbellis axillaribus solitariis vel terminalibus subpaniculatis, pedicellis angulatis calycis tubum æquantibus pedunculo brevioribus, operculo conico acuminato tuboque semiovato æquilongis, ...

Hab. In vallibus graminosis fluminis M'Arthur originem versus. (N. Holl. Sub-Trop., *Mitchell*, in hb. Hook.) Anth. Aug., Sept.

Arbor excelsior, *cortice dilute cinereo rugoso* in trunco ramisque *persistente*. *Folia* semipedalia vel paulo breviora, inferne ¾–1½ poll. lata, venis primariis patentibus, secundariis reticulato-anastomosantibus. *Flores* in specimine collecto nondum bene evoluti. *Pedunculi* tenues 2–3‴ longi. *Alabastra* 2‴ longa, postea forsan aucta. *Fructus* desunt.

Nativis cortex adhibetur ad habitatiunculas perrudes construendas.

II. *Folia alterna, latitudine vix aut paulo longiora.*

25. **Eucalyptus populnea** (E. populifolia, *Hook. in Mitch. Trop. Austral.* p. 204, non *Desfont.*). Arborea, ramulis tenuibus teretiusculis lævibus, *foliis* alternis *longe petiolatis* ovato- vel rhombeo-*orbicularibus* apice obtusis vel emarginatis basi acutiusculis *utrinque nitentibus* concoloribus pellucide punctatis subtiliter venosis, umbellis 3–7-floris axillaribus vel lateralibus solitariis vel simpliciter paniculatis, pedunculis calycem vix excedentibus, alabastris clavato-ovatis, calycis minuti tubo ecostato in pedicellum brevissimum attenuato operculi hemisphærici mutici longitudinem duplo excedente, *fructibus parvis turbinato-obconicis,* valvis inclusis, seminibus . . . .

Hab. In tractu orientali Novæ Hollandiæ subtropicæ passim sylvas constituens præsertim in collibus fertilioribus. Anth. Oct.–Dec.

Arbor mediocris, cortice sordide fusco-cinereo in trunco ramisque persistente rugoso et rimuloso. *Petioli* tenues teretiusculi sæpe 1″ longi. *Folia* 1½–3″ longa, 1–3″ lata, nonnunquam longitudine latiora. *Pedunculi* partiales 2–4‴ longi. *Calycis* tubus circiter 1½‴ metiens. *Stamina* albida 1‴ vix longiora. *Fructus* maturus deest.

III. *Folia opposita vel subopposita, latitudine vix aut paulo longiora.*

§ 1. *Valvæ prorsus exsertæ.*

26. **Eucalyptus platyphylla.** Arborea, ramulis teretiusculis, *foliis* alternis vel suboppositis longe petiolatis *ovato- vel cordato-orbicularibus* nunc subrhombeis raro ovato-lanceolatis opacis *prominenter penniveniis* pellucide punctatis, vena peripherica a margine remota, umbellis axillaribus vel lateralibus 3–7-floris, pedunculis angulatis calyci æquilongis vel eo longioribus, calycis breviter v. brevissime pedicellati tubo hemisphærico ecostato operculum semiglobosum muticum læve longitudine æquante, fructibus turbinato-hemisphæricis 3–4-loculatis vertice leniter convexis, *valvis* margini affixis *exsertis,* seminibus apteris.

Hab. In pascuis fertilibus ad flumen Burdekin. (Ora orient. trop., *A. Cunningham,* hb. Hook.) Anth. Sept.–Nov.

Arbor mediocris vel major, cortice trunci ramorumque lævi mox albido, secedentibus stratis extimis tenuibus fuscescentibus. *Petioli* semiteretes 1–1½″ longi. *Folia* tenui-coriacea utplurimum 2–3″ longa sæpe in petiolum breviter decurrentia. *Calycis* tubus 1½–2‴ metiens. *Operculum* pallidius simplex (qua nota a simili *E. bigalerita* præsertim dignoscitur). *Stamina* ad 3‴ longa albida. *Capsula* 2‴ longa.

E. bigaleritæ proxima.

§ 2. *Valvæ semiexsertæ.*

27. **Eucalyptus melanophloia.** Arborea, ramulis apice tetragonis, *foliis* glaucis raro viridibus fere semper *pruinosis oppositis* sessilibus

e basi amplexante *cordato-ovatis* tenuiter penniveniis et reticulato-venulosis vix pellucide punctatis, vena marginali obliterata, umbellis paniculatis vel axillaribus solitariis 3–6-floris, calycis tubo pedunculo angulato bis terve breviore pedicelli longitudinem parum vel pluries excedente semiovato-tetragono operculum late conicum acutum longitudine parum superante, fructibus semiovatis vel subpyriformibus 2–4-costatis ore parum contractis 4–5-loculatis, valvis infra marginem insertis subinclusis parum convexis, seminibus apteris.

Hab. A tractu montano Newcastle Range usque ad sinum Moreton Bay *Eucalypto crebræ* abunde adsociata, solum sterilius indicans. (N. Holl. Sub-Trop., *Mitchell.* Moreton Bay, *Moore.* Sydney Woods, Paris Exhib. No. 66, in hb. Hook.) Anth. vere exeunte.

Arbor minor, trunco irregulari, *cortice* persistente crasso profunde *sulcato rugoso nigrescente. Folia* 1½–3″ longa, 1–2″ lata, obtusa vel cuspidato-acuminata interdum cordato-lanceolata vel rite cordata. *Pedunculi* speciales pollicares. *Alabastra* circiter 4‴ longa. *Capsulæ* breviter vel brevissime pedicellatæ 2½–4‴ longæ vertice convexæ, raro 6-loculatæ. *Semina* fertilia angulato-ovata fusco-nigrita lævia 1‴ breviora.

Arbuscula "Silver-leaved Iron-bark" colonis designata, ex habitu proprio perfacile recognoscenda, sed characteribus floris fructusque sæpe variantibus ægre botanico describenda. Infelicissimus Leichhardt in opere suo (Overland Expedition, &c.) præter normalem etiam alteram speciem huic persimilem sed cortice squalide cano recedentem circum sinum Carpentaria et in Australia boreali-occidentali valde frequentem appellatione supra memorata comprehendit.

E. pruinosæ Schauer (non Turcz.) affinis.

§ 3. *Valvæ omnino inclusæ.*

28. EUCALYPTUS LATIFOLIA. Arborea, ramulis teretiusculis, *foliis* suboppositis sparsisve longiuscule petiolatis *lato- vel orbiculari-ovatis* obtusis glaucescentibus opacis imperforatis tenui-penniveniis, vena longitudinali margini prorsus contigua, umbellis terminalibus paniculatis paucifloris, pedunculis pedicellisque angulosis, illis duplo longioribus, *fructibus subcampanulatis ecostatis* 3–4-loculatis vertice planis, valvis ad marginem attingentibus.

Hab. In planitiebus ripariis ad partes superiores fluvii Roper, 8 Jul. 1856. Anth. æstate.

Arbor minor vel mediocris. *Cortex* post tardum delapsum strati cinerascentis supremi fulvescens lævis. *Folia* 2–3 raro 4″ longa, sæpe 2″ lata, petiolo fere pollicari prædita, crebrius et subtilius quam ea *E. bigaleritæ* pennivenia. *Umbellæ* simpliciter et composite paniculatæ. *Fructus* circiter 3‴ longi, summo margine leniter reflexi. *Valvæ* inclusæ. *Flores* non reperi.

Habitu *E. bigaleritam* simulans, characteribus potius *E. dichromophloiæ* accedens.

29. EUCALYPTUS ASPERA. Arborea, *ramulis* teretiusculis *hispidulis, foliis* parvis *oppositis* chartaceis *oblongo-ovatis* obtusis basi cordata *sessilibus* glaucis opacis *scabridis* penniveniis subtus reticulato-venulosis vix pellucide punctatis ad nervum asperis, vena longitudinali a margine remota, umbellis axillaribus sessilibus [brevi-pedunculatis pedunculis hispidis, R. K.] bi-paucifloris, pedicellis [glaberrimis, R. K.] fructu subcampanulato ecostato parum longioribus, valvis inclusis.

Hab. In planitiebus arenoso-rupestribus (Sandstone table-land) plus minus elevatis ad flumina Victoria et Sturt's Creek, in terra Arnheim's Land necnon prope sinum Carpentaria satis vulgaris. Anth. vere.

Arbor minor, cortice lævi cinereo-albido. *Folia* pleraque 1–2″ longa, 8–12‴ lata. *Fructus* fere 3‴ longi.

E. setosæ Schauer affinis.

30. EUCALYPTUS FERRUGINEA* (*Schauer in Walp. Rep. Syst.* ii. p. 296). Arborea, ramulis validis teretibus foliisque puberulo-scabris glabrescentibus, *foliis* oppositis crassiusculis ovato-oblongis basi cordata subsessilibus repandis *undulatis* obtusis vel acuminatis opacis imperforatis prominenter et *remote penniveniis* obscure reticulato-venulosis, vena peripherica imperfecta a margine remota, ... fructibus magnis globoso-ovatis ecostatis antice contractis et loculatis, capsulis demum a calyce solutis, valvis deltoideis inclusis, *seminibus antice longe alatis.*

Hab. In plagis elevatis rupestribus (Sandstone table-land) non rara per Australiam borealem et boreali-occidentalem. Anth. vere.

Arbor mediocris, cortice ubique persistente rugoso sordide cano. *Folia* utplurimum 3–4″ longa, inferne circiter 1½″ lata, nervis flavidis percursa et punctis elevatis scabriuscula. *Fructus* circiter 1″ longi, ad ¾″ lati, vertice plani. *Valvæ* solutæ marginem calycis vix attingentes. *Semina* omnia alata; fertilium ala ovata vel deltoidea, sæpe 3‴ longa. *Cotyledones* foliaceæ convolutæ. *Albumen* nullum. *Radicula* brevis cylindracea infera.

Species ad *E. ferrugineam* et *floribundam* appropinquans.

31. EUCALYPTUS MELISSIODORA (*Lindley in Mitch. Trop. Austr.* p. 235). Arborea, *ramulis* compresso-tetragonis *asperis,* foliis oppositis vel suboppositis ovatis vel subcordatis raro oblongo-lanceolatis *supra basin rotundatam subinflexam petiolatis scabris* opacis translucenti-punctatis penniveniis reticulato-venulosis, vena peripherica a margine inæqualiter remota, umbellis paniculatis 6–7-floris, pedunculis scabris: partialibus calyce longioribus angulatis, alabastris ovatis lævibus ecostatis brevissime pedicellatis, tubo operculum interius conico-hemisphæricum dimidio excedente, *operculo exteriore imperfecto,* fructibus campanulatis triloculatis vertice planis, valvis inclusis, seminibus lævibus apteris.

Hab. In montibus porphyriticis tractus Newcastle Range. Anth. Oct., Nov.

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* Sent as *E. undulata,* n. sp., by Dr. Mueller, but evidently the same as Schauer's plant.—(A. B.)

Arbor minor vel mediocris, trunco recto, *cortice undique persistente lamellari fragillimo squalide fulvo nitente*! *Ramuli* cum pedunculis scabritie cinerea et ferruginea obducti. *Folia* petiolo ½–1″ longo semitereti utplurimum supra basin raro ad marginem affixa, normaliter 2–3″ longa, 1½–2½″ lata, in abnormi specimine Mitchellii ad 5″ longa et 1″ tantum lata, nunc acuta, nunc obtusa immo emarginata. *Calycis* tubus nitens obconico-semiovatus 2–3‴ longus, in pedicellum brevissimum attenuatus. *Operculum* duplex, exterius castaneo-fuscum interiori accretum in frustulis tarde secedens; interius 1½‴ longum. *Fructus* circiter 4‴ longi exacte campanulati virentes vertice planiusculi, valvis supra medium tubi insertis. *Semina* brunnea nitentia. Species duplici nota memorabilis.

§ 4. *Species fructu incognito.*

32. EUCALYPTUS BIGALERITA. Arborea, ramulis teretiusculis, *foliis* alternis rarius oppositis longe petiolatis *cordatis vel subtrapezoideis* acutiusculis nunc acuminatis vix pellucide punctatis opacis penniveniis, vena peripherica a margine inæqualiter remota, umbellis lateralibus axillaribusque 4–7-floris solitariis, pedunculo crasso verruculoso calycibus parum longiore cum pedicello perbrevi anguloso, calycis tubo semiovato 3–2-costulato operculo triplo longiore, *operculo duplici*: *utroque* obtusissimo *coriaceo* vel externo apiculato, ...

Hab. In pratis fertilioribus sylvaticis tractus australis terræ Arnheim's Land (3–5 Jul. 1856). Anth. Jul.–Sept.

Arbor parva vel mediocris rarius excelsa, gummi-resina pulchre rubiginosa abunde scatens. *Cortex* post strati supremi lævis cinerei lapsum dilute *fulvidus* lævigatus. *Folia* pleraque 3–4″ longa, 2–3″ lata, petiolo inferne teretiusculo superne semitereti 1½–2″ longo prædita, satis saturate viridia. *Calyces* circiter 3‴ longi virides. *Operculum* externum (denique fuscescens) cito secedens bi–tri-costulatum, costis iisdem tubi continuis; operculum internum virens ecostatum. *Fructum* non habui.

33. EUCALYPTUS CONFERTIFLORA[*]. Arborea, *ramulis* teretibus *foliisque scabris*, foliis oppositis ovatis vel ovato-lanceolatis acutis basi subcordata amplexanti sessilibus prominenter penninerviis venosis opacis imperforatis, *umbellis* axillaribus lateralibus et terminalibus *in fasciculum multiflorum confertis*, pedicellis calyces pedunculosque longitudine duplo triplove excedentibus teretibus, calycis tubo obconico exangulato operculi patellaris apiculati lævis longitudinem triplo excedente, fructibus campanulatis.

Hab. A flumine Victoria ad rivum Gilbert in pascuis siccis proveniens. Anth. Oct., Nov.

Arbor mediocris squarrosa. *Corticis* stratum superficiale sordide cinereum ad trunci partem inferiorem persistens rimulosum in frustulis separabile; pars trunci superior ut rami læves albidi. *Ramuli* etiam juveniles cano-fusci. *Folia* pleraque 2½–4″ longa, 1½–2″ lata, interdum acuminata. *Glandulæ* oleiferæ non conspicuæ. *Pedunculus* primarius solitarius brevis vel brevissimus, in plures secundarios teretiusculos inæquales solutus. *Pedicelli* graciles ½–1″ longi. *Calycis* virentis tubus 3–4‴ longus. *Operculum* nitens tubo paulo angustius.

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[*] Sent by Dr. Mueller under the name of *E. floribunda*, which is preoccupied; the *E. floribunda* of Hügel being evidently quite distinct.—(R. K.)

E. ferrugineæ Schauer nimis videtur propinqua.

IV. *Folia opposita, latitudine conspicue longiora.*

34. EUCALYPTUS TETRODONTA. Arborea, ramulis angulatis, *foliis oppositis falcato-lanceolatis* sensim acuminatis modice petiolatis opacis indistincte penniveniis imperforatis, vena peripherica margini subcontigua, umbellis axillaribus terminalibusque solitariis bibracteatis trifloris, *bracteis tarde secedentibus majusculis*, pedunculo petiolum æquante angulato, *calyce* subcampanulato *quadridentato* sensim in pedicellum compressum tubo vix æquilongum attenuato dentibus deltoideis operculo hemisphærico et tubo fere duplo brevioribus patulis, ...

Hab. In plagis elevatis nemorosis minus fertilibus terræ Arnheim's Land passim. (Ad Portum Essington, *Armstrong*; et in ora boreali, *A. Cunningham*, in hb. Hook.) Anth. Aug., Sept.

Arbor mediocris, trunco gracili recto, cortice sordide cano fibroso ubique persistente. *Cortice* arborum "Stringy-bark-trees" dictarum prædita. *Ramuli* rufescentes rigiduli. *Folia* 3–6″ longa, ½–1½″ lata. *Pedunculi* 3–4‴ longi apice bracteas 2 cymbiformi-lanceolatas obtuse acuminatas circiter 3‴ longas deciduas gerentes. *Calycis* tubus additis dentibus 4–5‴ longus. *Operculum* coriaceum obtusum opacum viridulum.

Species calyce dentato quam maxime insignis, transitum ad Angophoras præbens.

V. *Sectio dubia.*

35. EUCALYPTUS BRACHYANDRA. Arborescens, ramulis angulatis, foliis alternis v. oppositis modice petiolatis chartaceis ovatis vel late oblongis obtusis opacis tenuiter penniveniis subtiliter venulosis imperforatis subtus pallidioribus, vena peripherica margini subcontigua, umbellis 3–5-floris in paniculam terminalem concretis, pedunculis angulatis, pedicellis tenuibus calyce brevioribus vel eidem æquilongis, operculo conico-hemisphærico tubo breviore, *filamentis perbrevibus, antheris didymis, fructibus minutis campanulatis* exangulatis ecostatis 3–4-loculatis vertice concavis, valvis subinclusis brevissimis, seminibus apteris.

Hab. In decliviis rupestribus ad partes fluvii Victoriæ superiores. Anth. primo vere.

Frutex arborescens. *Folia* utplurimum 1½–3″ longa, ⅔–1½″ lata obtusa ima basi acutiuscula. *Calyx* florifer 1‴ paulo excedens, fructifer sesquilinearis v. paulo longior. *Stamina* ad summum 1‴ longa! *Operculum* tantum in alabastris juvenilibus visum.

Species minutie florum et fructuum valde insignis.

36. Eucalyptus (E. clavigera, *A. Cunn. in hb. Hook.*) polysciada, *F. Muell.* sp. Arborea, ramulis validis teretibus junioribus angulatis, foliis alternis v. subopposititis breviuscule petiolatis ovatis v. lanceolatis acuminatis tenui-coriaceis imperforatis margine undulatis opacis glaucescentibus prominenter penniveniis et reticulato-venulosis, vena peripherica a margine inæqualiter remota, *umbellis* paucifloris v. frequentius *multifloris* inæqualiter pedunculatis partim divisis v. compositis *secus ramulos paniculam ditissimam aphyllam construentibus, pedicellis tenuibus angulatis calyce ter quaterve longioribus,* alabastris pyriformibus, calycis tubo obconico apice leviter ampliato ecostato exangulato operculum patellare nitens muticum longitudine aliquoties excedente, fructibus truncato-ovatis sublævibus, ...

Hab. In collibus apricis lapidosis et planitiebus aridis prope M'Adam Range. Anth. vere.

Arbor minor, cortice (si recte in memoria retento) lævi cinereo. *Folia* latitudine variabilia basi sæpe in petiolum decurrentia, plerumque 3–4″ longa, $\frac{3}{4}$–2″ lata. *Pedunculi* sæpe pedicellis breviores magis minusve compressi. *Pedicelli* $\frac{1}{2}$–1″ longi. *Calyx* addito operculo $2\frac{1}{2}$–3‴ longus. *Operculum* læve interdum paulo apiculatum. *Stamina* albida ad summum vix 3‴ longa. *Antheræ* ovato-oblongæ. *Fructus* 4‴ longus.

E. clavigeræ affinis.

37. Eucalyptus odontocarpa. Fruticosa, ramulis angulatis, *foliis oppositis* breviuscule petiolatis *lineari-* v. angusto-*lanceolatis* subfalcatis basi acutatis nitidulis pellucide punctatis penniveniis et reticulato-venulosis, vena peripherica a margine paulo remota, umbellis axillaribus subtrifloris breviter pedunculatis, *calycis* brevissime pedicellati *tubo* obconico acute *quadridentato* operculi depresso-hemisphærici longitudinem triplo excedente, fructibus ovato-obconicis indistincte costatis quadridentatis triloculatis, valvis infra marginem insertis inclusis.

Hab. In deserto arenoso ad rivum Sturt's Creek. Anth. autumno.

Frutex 8–10′. *Rami* sat tenues. *Folia* 2–5″ longa, 3–6‴ lata. *Umbellæ* interdum geminæ, altera depauperata. *Fructus* 3–4‴ longi nitentes.

38. Eucalyptus pachyphylla*. Fruticosa, ramulis juvenilibus angulatis, *foliis* alternis modice petiolatis crasso-coriaceis *ovatis* v. lanceolato-ovatis acuminatis vix inæquilateris imperforatis tenuissime penniveniis, vena peripherica a margine remota, umbellis axillaribus subtrifloris, pedunculis pedicellisque brevissimis, ... , *tubo calycis fructiferi depresso-hemisphærico quadricostato* et obsolete

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* Not *E. pachyphylla*, Cunn. MSS., from King George's Sound (No. 231 of 4th Voyage).

costulato, *margine* elevato, capsulæ 4–5-loculatæ vertice convexo, valvis subexsertis, seminibus fertilibus angusto-alatis sublævibus.

Hab. In eremo arenoso ad Hooker's Creek. Anth. autumno.

Frutex orgyalis v. paulo altior. *Folia* pleraque $1\frac{1}{2}$–$2\frac{1}{2}''$ longa in speciminibus siccis opaca. *Flores* incogniti. *Fructus* diametro 6–8''', margine demum supra valvas producto. *Semina* fertilia alis additis circiter $1\frac{1}{2}'''$ longa.

E. alpinæ propinqua.

Tentamen dispositionis Eucalyptorum Australiæ intratropicæ et subtropicæ, secundum corticis structuram, texturam, et separationem, usui Colonorum accommodatum.

I. LEIOPHLOIÆ. Cortex post delapsum strati supremi undique lævis. (Vulgo: Flooded Gum-trees, White Gum-trees, Blue Gum-trees partim, Red Gum-trees partim, Yarra-trees.)

II. HEMIPHLOIÆ. Cortex in trunci parte inferiore persistens rugosus et rimosus, in parte superiore ramisque delapsu strati superioris lævigatus. (Vulgo: Moreton Bay Ash, Black-butted Gum-tree, Box-trees partim.)

III. RHYTIPHLOIÆ. Cortex ubique persistens rugosus et rimosus intus solidus. (Vulgo: Bloodwood-trees, Box-trees partim, Peppermint-trees partim.)

IV. PACHYPHLOIÆ. Cortex ubique persistens rugosus intus fibrosus. (Vulgo: Stringy-bark-trees.)

V. SCHIZOPHLOIÆ. Cortex ubique persistens profunde sulcatus intus solidus. (Vulgo: Ironbark-trees.)

VI. LEPIDOPHLOIÆ. Cortex saltem in trunco persistens lamellaris friabilis. (Vulgo: Melaleuca Gum-trees, Mica-trees.)

I. LEIOPHLOIÆ

§ 1. *Folia alterna subfalcata concoloria.*

1. *E. tereticornis*, Sm. (1.) Operculum elongatum conico-subulatum curvatum. Valvæ alte exsertæ.
2. *E. rostrata*, Schlecht. (2.) Operculum subulato-acuminatum rectum. Valvæ alte exsertæ.
3. *E. signata.* (6.) Operculum hemisphæricum. Valvæ vix exsertæ. Fructus semiglobosi.
4. *E. variegata.* (13.) Operculum hemisphæricum. Valvæ inclusæ. Fructus semiovati.

5. *E. citriodora,* Hook. (23.) Operculum hemisphæricum ? Valvæ . . . . Odor foliorum citreus.

6. *E. brevifolia.* (3.) Operculum hemisphæricum. Valvæ exsertæ.

7. *E. dichromophloia.* (17.) Operculum semiovatum. Valvæ inclusæ. Semina alata.

§ 2. *Folia alterna subfalcata discoloria.*

8. *E. hemilampra.* (7.) Operculum elongato-conicum rectum. Valvæ semiexsertæ.

§ 3. *Folia alterna et opposita ovata vel orbiculata.*

9. *E. bigalerita.* (32.) Operculum duplex. Valvæ . . . .

10. *E. latifolia.* (28.) Operculum . . . . . . Valvæ inclusæ.

11. *E. platyphylla.* (26.) Operculum hemisphæricum. Valvæ exsertæ.

§ 4. *Folia opposita subovata.*

12. *E. aspera.* (29.) Operculum . . . . Valvæ inclusæ.

II. HEMIPHLOIÆ.

§ 1. *Folia alterna subfalcata.*

13. *E. tessellaris.* (14.) Operculum patellare. Valvæ inclusæ.

14. *E. semicorticata.* (8.) Operculum acuminatum. Valvæ subexsertæ.

§ 2. *Folia opposita cordato-ovata.*

15. *E. confertiflora.* (33.) Operculum patellare. Valvæ . . . .

III. RHYTIPHLOIÆ.

§ 1. *Folia alterna subfalcata.*

16. *E. polycarpa.* (15.) Operculum . . . . Valvæ profunde inclusæ. Paniculæ multifloræ. Semina alata.

17. *E. terminalis.* (16.) Operculum . . . . . . Valvæ breviter inclusæ. Paniculæ multifloræ. Semina alata.

18. *E. tectifica.* (24.) Operculum conicum acuminatum. Valvæ . . . . .

19. *E. leptophleba.* (9.) Operculum . . . . Valvæ subinclusæ. Rami undique corticati.

20. *E. microtheca.* (10.) Operculum . . . . Valvæ subinclusæ. Rami apice decorticati.

21. *E. patellaris.* (4.) Operculum patellare umbonatum. Valvæ exsertæ.

22. *E. trachyphloia.* (18.) Operculum . . . . Valvæ profunde inclusæ. Semina aptera.

23. *E. bicolor*, A. C. (19.) Operculum hemisphæricum. Valvæ inclusæ. Semina aptera.

§ 2. *Folia alterna rotundata.*

24. *E. populnea.* (25.) Operculum hemisphæricum. Valvæ inclusæ.

§ 3. *Folia opposita cordato-ovata.*

25. *E. ferruginea*, Schauer. (30.) Operculum . . . . . . Valvæ inclusæ. Semina alata.

IV. PACHYPHLOIÆ.

§ 1. *Folia alterna subfalcata.*

26. *E. fibrosa.* (11.) Operculum conicum. Valvæ breviter exsertæ.

27. *E. exserta.* (5.) Operculum conicum. Valvæ alte exsertæ.

28. *E. ptychocarpa.* (20.) Operculum hemisphæricum costatum. Valvæ profunde inclusæ.

§ 2. *Folia opposita subfalcata.*

29. *E. tetrodonta.* (34.) Operculum hemisphæricum. Tubus quadridentatus. Valvæ . . . .

V. SCHIZOPHLOIÆ.

§ 1. *Folia alterna subfalcata.*

30. *E. crebra.* (12.) Operculum semiovatum. Valvæ breviter exsertæ.

§ 2. *Folia opposita cordato-ovata.*

31. *E. melanophloia.* (27.) Operculum late conicum. Valvæ breviter exsertæ.

VI. LEPIDOPHLOIÆ.

§ 1. *Folia alterna subfalcata.*

32. *E. aurantiaca.* (21.) Operculum semiglobosum costatum. Valvæ inclusæ. Fructus sessiles.

33. *E. phœnicea.* (22.) Operculum . . . . . . Valvæ profunde inclusæ. Fructus pedicellati.

§ 2. *Folia opposita cordato-ovata.*

34. *E. melissiodora*, Lindl. (31.) Operculum conico-hemisphæricum subduplex. Valvæ inclusæ.

VII. SECTIO DUBIA.

35. *E. brachyandra.*

36. *E. clavigera*, A. C.

37. *E. odontocarpa.*

38. *E. pachyphylla.*

On some Tuberiform Vegetable Productions from China.

By the Rev. M. J. Berkeley, M.A., F.L.S.

[Read April 15th, 1858.]

Some months since I received, by the kindness of Professor Horaninow, two tuberiform productions from China, of which one was nearly allied to *Mylitta australis*, Berk., and the other, marked *Pachyma Coniferarum*, Horaninow, was evidently identical with the Tuckahoe or Indian Bread of the United States, *Pachyma Cocos*, Fries.

At a later period, specimens of a drug, known in China under the name of Pe-foo-ling, were shown by Mr. Daniel Hanbury to Mr. Kippist, who at once pointed out their identity with *Lycoperdon solidum* of the 'Flora Virginica,' *Pachyma Cocos*, Fries.

The subject was brought to my especial notice by Dr. Hooker; and having ascertained the identity of the productions of Mr. Hanbury and Prof. Horaninow, I thought that a short note on it might possibly be acceptable to the Society; and the more so, as Mr. Hanbury has a second production very nearly allied, while I am in possession of a third very distinct though allied substance, through Prof. Horaninow.

The best introduction to my note will be an extract from a letter received by me from Mr. Hanbury:—

"There are *two* Chinese esculent *Fungi*, which I think are worthy of notice. My attention was first drawn to them while examining some specimens of Chinese Materia Medica, by stumbling on the following passage in Loureiro's 'Flora Cochinchinensis' (ed. Willd. 1793, p. 710):—

"'Ad radices Pinorum sylvestrium magnæ longævitatis in provincia boreali Chinensi *Su chuyen* gigni solent quædam tubera, subrotunda, magna, scabra, fusca, intus albissima, quæ ab Europæis vocantur *Radix Sinensis alba*, a Cochinchinensibus *Bach phuc linh*, ab ipsis vero Sinensibus *Pĕ fú lĭn*. Horum tuberum decocto feliciter utuntur in praxi medica, præcipue in morbis pulmonum et vesicæ.

"'Radix Sinensis rubra provenit ex diversa planta, quæ a Linnæo dicitur *Smilax China*.'

"Nor was my curiosity diminished by finding in Endlicher's 'Enchiridion Botanicum' (p. 144) the following allusion to the same subject:—

"'In annosis *Pinus Massonianæ* Lamb. radicibus apud Sinas gigni solent tubera (vulgo *Pe-fu-lin*, Radix Sinensis alba) magna, subrotunda, extus scabra, fusca, intus albida, insipida, tactu ceracea, quorum decocto in morbis pulmonum et vesicæ utuntur.'

"I therefore wrote to my brother Thomas Hanbury of Shanghai, who obtained for me not only the substance called *Pe-foo-ling*, but a second, known as *Choo-ling*, together with some cakes said to be made from one or both of them. These cakes, or an imitation of them, are commonly sold in the streets of Shanghai; and the cry of the itinerant vendors—*Ã Hoo Ka Foo-ling Ka!*—is one of the first of the many strange sounds to salute the ear of the newly-arrived foreigner.

"With respect to the *Foo-ling* itself, my first impression was to regard it as the rhizome of some species of *Smilax*, allied to *S. China*, L., the source of the drug known as *China Root*. Such was the opinion of the older writers, as Martini, who, in his 'Novus Atlas Sinensis' (1655), describes it as being the *true* China Root. Cleyer also, in his 'Specimen Medicinæ Sinicæ' (1682), says of it[*], 'Est idem quod Lusitanice dicitur Pao de China, nisi quod album et multo melius sit rubeo illo, et etiam carius multo.'

"I had soon, however, to alter my opinion on testing a decoction of the *Foo-ling* with iodine and finding it to contain no starch, the abundant presence of that body being a marked character of the Smilax rhizome. I found also, upon turning to the 'Herbarium Amboinense' (xi. 123), where Rumphius describes it as *Hoelen*, that its distinctness from China Root had been there noticed. Mr. Kippist, however, soon settled the question, by pointing out to me in the 'Linnean Transactions[†]' a paper by Dr. James Macbride, of South Carolina, entitled "Some account of the *Lycoperdon solidum* of the Flora Virginica," read before the Society 3rd June, 1817; and at the same time laying before me a fine series of specimens of *Lycoperdon solidum*, with which plant it was evident the Chinese *Pe-foo-ling* was, if not identical, at least very nearly related.

"Of the *Choo-ling*, I have nothing to tell you, except that, in common with the *Pe-foo-ling*, it is described and figured in the great Chinese Herbal, the *Pun-tsaou*."

Mr. Hanbury has, in addition to these remarks, furnished me with a translation of that portion of the 'Pun-tsaou' which relates to these productions, which I have the pleasure of now laying before the Society[‡].

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[*] *Medicamenta simplicia*, No. 189.

[†] Vol. xii. p. 368.

[‡] *Fuh-ling* and *Choo-ling*.—Abstract of the account given in the great

A microscopical examination of the several specimens of Fooling from Messrs. Horaninow and Hanbury, and a comparison with a fine series from South Carolina, sent to me by Mr. Curtis,

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Chinese Herbal, 'Pun-tsaou-kang-muh,' Chap. 37. sect. 4. (Translated by the Rev. W. C. Milne.)

茯苓 *Fuh-ling* : synonyms 伏菟 *Fuh-too*, — *too* being a name given to it because it is found on the same tree as the *Too-sze*, another medicinal plant; or rather, as some say, because it resembles a small hare.

松腴 *Sung-yu*, a name derived from its connexion with the pine-tree.

不死麫 *Puh-sze-mien*, literally *Undying-flower*.

伏神 *Fuh-shin*, which name is restricted to a species to be found clinging to the root of the pine. Such, it is presumed, contains the finest essence of the pine. One of the fairy tales says, that there are pieces of this species to be found as big as a man's fist, one of which, if you sling it as an amulet round your person, will discomfit a hundred devils, in full proof of its divine origin.

In describing the Fuh-ling, one author observes that both it and the species called Fuh-shin grow under the large pines on the heights and valleys of lofty mountains, and that they may be gathered in the second and eighth moons [*i. e.* during spring and autumn].

Another writer remarks, that samples come from Yuh-chow as large as a vessel with a capacity of three or four shings [pints]. The outer skin is black, with small wrinkles on it; underneath it is fine and white. It appearance is that of a small tortoise; and that with a reddish tinge is not unlike a frog after being imbedded underground for thirty years.

A third writer notes that Fuh-ling is produced in the Tai-shan mountains of the province of Shantung, but that the best kind is decidedly that of the Hwa-shan hills of Shen-se.

According to the testimony of a fourth writer, wherever large pines flourish you have the Fuh-ling; but as at Hwa-shan there stands an immense number of old firs, you have there excellent specimens.

A fifth observer remarks, that pines of 1000 years old are sure to have the Fuh-ling; but a sixth observes, that after the resin of the pine has fallen on the ground and remained there 1000 years, it is changed into Fuh-ling. When you see the pine-tree turn red, you have the Fuh-ling. Fuh-shin is a product of the pine superior to the Fuh-ling.

At present all the hills of the Hwa-shan range produce it. It clings to the under-roots of the pine-trees, and grows leafless and flowerless, as large as a man's fist. Sometimes underground you meet with it so big as to be several catties* in weight. There are two varieties, red and white. Some say it is the gum of the fir-tree metamorphosed; and others, that it is the excrescence of the spurious pine-tree. But down to the present day there are people who constantly meet with the Fuh-ling under masses of very old pines which have long been cut down, and whose trunks, branches, and twigs lie about rotten and decaying.

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* The catty equals 1⅓ lb.

as also with a portion of an authentic specimen of Schweinitz, show that they are all identical. The structure varies a little with age, and in Horaninow's specimens there are abundant very

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To procure it, a plot of ground is cleared and probed with an iron barbed instrument. Should any Fuh-ling be there, it will be impossible to pull out the instrument again, except by digging about it.

[Under this heading some legends are given, which it is needless to translate, as they would be unintelligible, and (as the author hints regarding one) are treated with little faith.]

Five forms of Fuh-ling are mentioned as of medicinal use, viz.:—

1. Ordinary Fuh-ling.
2. Red Fuh-ling.
3. Fuh-ling bark.
4. Fuh-shin.
5. Shin-muh or Hwang-shin-tsoh, a rare species found in the heart of the Fuh-shin: one of its names signifies *Yellow-fir-knot.*

In the preparation of this medicinal plant, whoever uses the bark must put away the heart of the Fuh-ling, then pound the bark small in a basin of water, take off the scum and filter the water. An erroneous application of this may prove hurtful to the eye. To make it into powders or pills, let it be boiled thoroughly two or three times, and then dried.

Its taste and smell are agreeable, and not poisonous.

The class of diseases for which it is used are, to sum them up generally, pains in the chest, severe ague, great debility, depression of spirits, stoppage of urine, want of sleep, excess of phlegm, dropsy, affections of the kidneys, violent retching, rheumatism, infantile convulsions, fatigue in body and mind, dysentery, disease in the groin, and female complaints.

豬苓 *Choo-ling*, derives its name, first, from its resemblance in colour to the fæces of the pig (*Choo*); and secondly, from its being found lying here and there as droppings from the tree upon which it is parasitic. Its other names indicate the same, viz.

豭豬屎 *Kia-choo-she*, literally *Hog's-dung.*

豕槖 *She-tŏh*, literally *Pig's-entrails?*

地烏桃 *Te-woo-taou*, literally *Earth-walnuts.*

The following is an abridged summary of the opinions of various Chinese observers relative to the Choo-ling.

It is found principally on the heights and valleys of Hang-shan*, as also in Shuh-chow and Seih-chow.

It is picked up in spring and autumn. It is a parasite on the Fung-shoo tree [*Acaciæ* sp.?], though also found upon other trees. It much resembles the Fuh-ling.

The skin of the Choo-ling is black, but the flesh is white and firm. It can be used only after scraping off this skin. In preparing it for medicinal purdelicate threads which traverse the mass in every direction; but the nature of the bodies of which the greater part of the substance is composed, their form, and chemical characters are precisely the same, and there can be no doubt that they all belong to one and the same category.

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* [Either in the province of Kiang-nan, or in that of Hoo-nan.]

This matter consists of irregular bodies, varying very greatly in size, often globular, but frequently forming broad bands with transverse markings and clefts, exhibiting no trace of starch under iodine, and without the slightest appearance of an investing membrane. This substance has been submitted to chemical investigation by Professor Ellett of South Carolina College, and has been ascertained to consist entirely of pure pectine of Braconnot. It is quite insoluble in water, though it dissolves in alkaline solutions, forming neutral pectates, whence the pectic acid is separated, by the addition of muriatic acid, in the form of a colourless jelly. By a particular management, with the details of which I am not acquainted, this jelly may be prepared so as to form an agreeable article for the dessert*.

It is not surprising, therefore, that it is manufactured in China into a popular and nutritious food. It is probable that the cakes which are made of it are regarded as medicinal as well as economical; and it is curious that Prof. Ellett remarks that the nutritious jelly formed from the Tuckahoe is an excellent antidote against several of the most powerful mineral poisons.

The structure of the Choo-ling is somewhat different from that of the Foo-ling. The several parts are far smaller in their dimensions, and there are none of the streaked and incised bands. The greater part of the mass consists of short, sometimes forked, and

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poses, scrape off the coarse skin with a copper knife, cut the Choo-ling into thin slices, and steep them in Tung-lew† water for a whole night; drain off the water thoroughly; pack the slices in a bundle of Shing-ma‡ leaves for a day, and, on removing the wrapper, they will be quite dry and fit for use. The smell and taste of the Choo-ling are mild, sweet, and not poisonous—something like the Fuh-ling.

The diseases for which it is generally used are, severe ague, severe dropsy, long-suppressed urine, debility and age, abdominal swellings attended with violent pains, depression of spirits, diseases in the groin, dysentery, and some affections peculiar to females in pregnancy.

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* See "Observations on Tuckahoe," in Gardener's Chronicle, 1848, p. 829.

† [If Tung-lew is the name of a place, it is in the department of Che-chow, province of Ngan-hwuy.]

‡ *Shing-ma*, literally the *Ascending Hemp*: it is described in the 'Pun-tsaou,' chap. 13. fol. 29.

sometimes torulose linear bodies, varying, however, much in outline; and dispersed among them are a number of small granules, many of which contain a minute nucleus; while other larger bodies, exhibiting one or two faint traces of concentric circles, are scattered about, exactly like the asci of a truffle, but containing only a very small irregular nucleus. Treated with the same chemical tests as the Foo-ling, it exhibits precisely the same reaction. There is not the slightest trace of starch or cellulose, and it is evident that the structure is not accordant with that of any Fungus or phænogamous Tuber.

As there is some outward resemblance between this production and the tuberiform body which precedes the growth of *Peziza tuberosa*, I have made a comparative examination of the two, and though there is some resemblance as regards chemical reaction, the structure is totally different. In the *Peziza* tuber the whole mass consists of large threads with very thick gelatinous walls, and an abundant proteinous endochrome.

No fungus has ever been found on the American or Chinese tubers, and, unfortunately, *Pachyma tuber regium*, which gives rise to a species of *Lentinus*, as figured by Rumphius, is quite unknown. It is probably, however, of the same nature with the Pietra funghaja or Fungus-stone of Italy (a mere mass of earth and mycelium), which produces the edible *Polyporus tuberaster* even in our own hothouses.

Unfortunately but little light is thrown upon the real nature of these productions by all the specimens and information we possess. Dr. Macbride asserts that the Tuckahoe originates between the wood and bark of *living* roots; that it gradually detaches the bark, while it spreads round the wood and converts it into a substance similar to itself; and that if it comes in contact with the root of another tree, that root is also assimilated with it. Specimens, however, are wanting to show this transitional state.

I have still to notice briefly the third production sent to me by Prof. Horaninow, of which I forward a portion for your inspection. It is evidently closely allied to the native bread of Australia, but differs in the reddish, not black, cuticle, which does not crack and peel off, the total absence of an intermediate stratum between the cuticle and central mass, and the want of large clavate cells amongst the linear bodies of which the central mass is composed. The internal substance is marbled like a truffle; but there is not a trace of fruit, and in consequence, together with *Mylitta australis*, it must be considered of very doubtful affinity.

Notes on *Abuta*, a genus of *Menispermeæ*. By N. Grisebach, Professor of Botany in the University of Göttingen. Communicated by Dr. J. D. Hooker, F.L.S.

[Read March 18th, 1858.]

The *Menispermeæ* of tropical America, though less numerous than those of the East Indies, are in a state of some confusion; and when I studied the West Indian forms for my intended Flora of those islands, Aublet's *Abuta* seemed to require a particular investigation. Miers had reduced correctly to *Abuta* Persoon's genus *Trichoa* (*Batschia*, Thunb.), but at the same time he excluded *Abuta concolor*, Poepp., which Endlicher before him had referred to *Trichoa*. From this South American species, and from the West Indian *Cocculus domingensis*, which, together with some other forms, he considered congeners, Miers constructed his new genus *Anelasma* (Ann. Nat. Hist. 2nd ser. vii. p. 37 *seq.*). The result of my inquiries is, however, at variance with his views, and the object of these remarks is to prove that *Abuta* is a distinct genus of *Cocculeæ*, comprising Aublet's and Poeppig's species, and that *Cocculus domingensis* does not belong to the same. The character of *Abuta*, which, as Miers has well suggested, approaches most to the East Indian genus *Tiliacora* (distinct by a greater number of carpels), is the following:—

Abuta, Aubl. Char. gen. *Sepals* 6, biserial, the interior larger. *Petals* 0. ♂: *Stamens* 6. ♀: *Ovaries* 3; styles cylindrical, uncinate. *Drupes* large, ovoid: the cavity divided by a thin vertical plate of the endocarp, penetrating from the base to the arch of the seed. *Seed* completely inflexed, with the inner sides flat and accumbent to the plate: *endosperm* thick, ruminated, and separated by numerous horizontal incisures penetrating almost to the middle: *embryo* inflexed-cylindrical, almost equalling in length the endosperm, and included by its central channel.—Woody vines; leaves *leathery, entire, with the petiole thickened at the top;* flowers *small, arranged in axillary racemose panicles.*

The materials upon which this character has been constructed are: 1st, flowers of both sexes and fruit of *A. rufescens*, Aubl., from the Rio Negro, in the Brazilian Collection of Spruce (♂, *Abuta*, no. 2; ♀, no. 2340; fruit, no. 2303); 2nd, male flowers and fruit from the same (♂, no. 2829; fruit, no. 2102).

The genus is distinct from *Cocculus* chiefly by its ovoid (not compressed) drupes, by its ruminated endosperm, and by wanting petals: but its character, as given by different authors, was either incomplete or erroneous. Thus, if we compare our specimens with the analysis of *A. concolor*, as represented by Poeppig (Nov. Gen. t. 190), his 3 petals do not exist, the monadelphy is only a slight adherence of the stamens at the base itself, and his embryo (figured erroneously on the inner side of the endosperm, and bearing foliaceous cotyledons) is merely a thickening of the endocarpic dissepiment, the real embryo having been overlooked in the interior channel of the endosperm. Miers, on the other hand, of whom I have compared such materials as exist in Sir W. Hooker's and Bentham's herbaria, was mistaken, in consequence of the incompleteness of the specimens, in his character of *Anelasma*, which he describes as apetalous, and presenting an exalbuminose embryo with large thick cotyledons,—though Poeppig, with respect to *A. concolor*, had given a nearly correct idea of the large ruminated albumen, formed exactly in the same way as in *A. rufescens*, and though *Cocculus domingensis*, the second species of his genus *Anelasma*, exhibits 6 petals in its male flower. A seed of the latter, which had been examined by Miers, I found not impregnated, and in consequence the drupe filled only partially by a dead tissue, taken possibly for an exalbuminose embryo.

Abuta rufescens, Aubl., is characterized by ovate, pointed, five-nerved leaves, velvety on their under side, and by the inflorescence and the ovaries downy. Its apparent synonyms are *Batschia racemosa* and *conferta*, Thunb. (Nov. Act. Ups. v. t. 2. f. 1, 2,—a tolerable representation of the genus), both forms from New Granada,—the range of the species comprising the whole of equatorial America from that country to the Amazons and Guiana.

A. concolor, Poepp., approaching in habit to *Cocculus domingensis*, is distinguished by elliptical polished leaves, the primary veins of which are separate at the base itself, and the tertiary veinlets not prominent. Its synonyms are, *Anelasma Spruceanum*, Miers!, *A. guianense*, Miers!, and probably *Cocculus lævigatus*, Mart. Its geographical range comprises a still larger area, viz. equatorial Brazil!, Goyaz (Gardn. no. 3567!), Cayenne (Martin).

Notes on Arctic Plants. By E. Dickie, Esq., M.D., A.L.S., Professor of Natural History, Queen's College, Belfast.

[Read April 15th, 1858.]

Dr. J. D. Hooker, in April 1856, communicated to the Linnean Society "Remarks on some Collections of Arctic Plants." It being desirable that as many facts as possible should be placed on record respecting the vegetation of the North Polar circle, I have thought it right to put together notes on small collections made at various periods by some of my former pupils, while in medical charge of whaling vessels.

The specimens were contributed by Messrs. W. F. Clarke, A. K. Clark, Maitland, Philips, Craig, and Sutherland.

The localities extend on the east side of Davis's Straits, from lat. $69\frac{1}{2}$° N. to 76° N.; and on the west side from 65° N. to 74° N.

One of these gentlemen, Dr. P. C. Sutherland, now of Port Natal, made good collections when attached to Penny's and Inglefield's expeditions; records of these are appended to the published accounts of these voyages.

Ranunculus nivalis, *L.*	Cape Lawson; Black Hook.
R. hyperboreus, *Rottb.*	Operniwick (full flower July 15); Durban Harbour.
Papaver nudicaule, *L.*	Operniwick (full flower July 15); Cape Lawson (full flower June 22); Duck Islands; North Foreland; Exeter Bay; Durban Harbour.
Draba alpina, *Wahl.*	Black Hook (full flower June 14); Pond's Bay.
D. rupestris, *R. Br.*	Cape Lawson (full flower June 22); Frau Islands (full flower July 15); Cape Searle; Durban Harbour.
Cardamine bellidifolia, *L.*	Frau Islands (flower July 15).
Vesicaria arctica, *Richards.*	Black Hook (flower July 27).
Platypetalum purpurascens, *R. Br.*	Black Hook, sea-level to 500 feet.
Cochlearia fenestrata, *R. Br.*	Cape Searle.
C. anglica, *D.C.*	Cape Dudley Digges; Durban.
Silene acaulis, *L.*	Operniwick (flower July 15); Black Hook; Exeter Bay.
Lychnis apetala, *L.*	Operniwick (flower July 15); Cape Searle; Durban.
Stellaria longipes, *Goldie*	Durban.
Arenaria rubella, *Hook.*	Exeter Bay; Durban.
A. Rossii, *R. Br.*	Operniwick.
Honckencya peploides, *Ehrh.*	Operniwick; Rugged Rock.
Cerastium alpinum, *L.*	Black Hook; North Foreland; Exeter Bay; Cape Searle (flower August 23); Durban; Cumberland Inlet.
Oxytropis campestris, *D.C.*	Pond's Bay (flower July 27).
Astragalus alpinu *L.*	Pond's Bay (flower July 27).

Dryas octopetala, *L.*	Cape Searle.
D. integrifolia, *Vahl*	Cape Lawson (flower June 22); Cape Dudley Digges; Cape Searle.
Potentilla nivea, *L.*	Cape Lawson (flower June 22); Black Hook (flower June 24); Duck Islands; Cape Searle; Pond's Bay; Durban.
Epilobium latifolium, *L.*	Cape Searle (flower August 23); Cape Dudley Digges, sea-level to 500 feet; Durban.
Saxifraga tricuspidata, *Retz*	Cape Searle (flower August 21); Cape Dudley Digges.
S. nivalis, *L.*	Operniwick; Cape Searle (flower August 21); Black Hook; Durban.
S. cæspitosa, *L.*	Pond's Bay; Operniwick; Waigat Strait; Cape Searle (August 21 in flower).
S. cernua, *L.*	Pond's Bay; Operniwick; Cape Searle (in flower August 23); Durban.
S. rivularis, *L.*	Mollymoak Head.
S. rivularis, var. hyperborea	Black Hook, three miles inland.
S. oppositifolia, *L.*	Cape Lawson (flower June 22); Exeter Bay; Waigat Strait.
Galium pusillum, *L.*	Cape Dudley Digges.
Gnaphalium supinum, *L.*	Durban (September 1, in flower); Cumberland Inlet.
Arnica montana, *L.*	Frau Islands; Cape Searle; Durban.
Erigeron uniflorum, *L.*	Cape Searle.
Campanula linifolia, *A. D.C.*	Cape Searle (flower August 21); Durban.
Vaccinium uliginosum, *L.*	Operniwick; Durban (flower Sept. 1).
Azalea procumbens, *L.*	Operniwick; Duck Islands; Durban (flower July 13).
Pyrola rotundifolia, *L.*	Cape Dudley Digges; Durban, sea-level to 200 feet (flower September 1).
Cassiopea tetragona, *Don*	Operniwick; Exeter Bay; Black Hook, sea-level to 500 feet.
Ledum palustre, *L.*	Durban; Cumberland Inlet.
Phyllodoce taxifolia, *Don*	Durban (flower August 21).
Rhododendron Lapponicum, *L.*	Cape Lawson (flower June 22); Durban (flower September 1).
Arctostaphylos alpina, *Sprengel*	Exeter Bay; Durban.

Menyanthes trifoliata, *L.*	Exeter Bay.
Armeria maritima, *Willd.*	Cape Searle.
Diapensia Lapponica, *L.*	Frau Islands.
Mertensia maritima, *Don*	E. side of Searle Roads.
Pedicularis hirsuta, *L.*	Cape Lawson (flower June 22); Operniwick (flower July 6); Black Hook (flower July 12).
Empetrum nigrum, *L.*	Operniwick, sea-level to 800 feet (flower July 15).
Polygonum viviparum, *L.*	Cape Searle; Operniwick; Durban.
Oxyria reniformis, *Hill*	Operniwick, sea-level to 400 feet (flower July 15).
Salix arctica, *R. Br.*	Operniwick; Four Island Point; Exeter Bay; North Foreland; Durban.
S. herbacea, *L.*	Operniwick (flower July 15).
Tofieldia borealis, *Wahl.*	Durban; Operniwick.
Juncus biglumis, *L.*	Durban.
Luzula campestris, *R. Br.*	Operniwick; Frau Islands; North Foreland; Cape Lawson; Cape Searle.
L. hyperborea, *R. Br.*	Durban; Cumberland Inlet.
Festuca brevifolia, *R. Br.*	Durban Harbour.
Poa abbreviata, *R. Br.*	Durban Harbour.
P. cæsia, *Sm.*	North Foreland.
P. arctica, *Hook.*?	Operniwick, sea-level to 1000 feet.
Phippsia algida, *R. Br.*	Cape Dudley Digges; Cumberland Inlet.
Hierochloe pauciflora, *R. Br.*	Cape Searle.
Alopecurus alpinus, *Sm.*	Cape Lawson; Cape Searle; Black Hook; Cumberland Inlet.
Trisetum subspicatum, *Beauv.*	Cape Searle; Durban.
Eriophorum vaginatum, *L.*	Black Hook; Operniwick.
E. polystachyum, *L.*	Black Hook; Durban.
Carex nardina, *Fries*	Cape Searle; Waigat; Operniwick; Durban.
C. rupestris, *All.*, No. 2.	Cape Lawson.
C. glareosa, *Wahl.*	Waigat Strait; Durban; Cumberland Inlet.
C. fuliginosa, *Sternb. & Hoppe*	Cape Searle; Black Hook.
C. stans, *Drejer*	Cape Searle; Durban.
C. compacta, *R. Br.*	Operniwick.
Lycopodium Selago, *L.*	Cape Lawson; Durban, sea-level to 800 feet.
Equisetum arvense, *L.*	Durban Harbour.
Cystopteris fragilis, *Bernh.*	Black Hook, at 400 feet.

On a new species of *Bellevalia* from Mount Ida. By MAXWELL T. MASTERS, Esq., Lecturer on Botany at St. George's Hospital, &c. Communicated by the SECRETARY.

[Read May 6, 1858.]

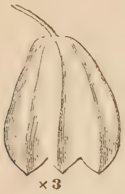
AMONG the plants collected on Mount Ida by the medical officers attached to the Civil Hospital at Renkioi, during the Crimean war, is what appears to be a new species of *Muscari*, or rather of *Bellevalia*, Kunth. For this opportunity of describing it, I am indebted to my friends Drs. Armitage and Playne; and I regret that the name proposed for it (supposing it to be an undescribed species of *Muscari*) is not applicable. Under this name, *Muscari latifolium*, it has been described by Dr. Kirk, one of its discoverers, in a paper read before the Botanical Society of Edinburgh, in January, and reported in the 'Edinburgh New Philosophical Journal' for April. But though in habit and external appearance it presents the greatest resemblance to the species of *Muscari*, yet the form of the perianth and the consolidated condition of the styles and stigmata necessitate its being placed in the genus *Bellevalia* of Kunth. If I am right in this conjecture, I would venture to propose the name of *Bellevalia Muscarioides* for it, and thus to define its characteristics more fully than has been done in the report above referred to.

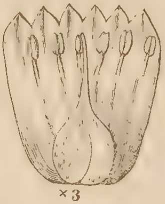
Bellevalia. Floribus inferioribus campanulatis basi angulatis pedicellatis horizontaliter patentibus vel pendentibus; superioribus tubulosis sessilibus approximatis neutris; folio unico erecto oblongo-acuto versus basin attenuato.

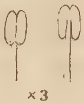
Descr.—Habit, that of the species of *Botryanthus* or *Muscari*, Kunth.—*Bulb* ovate. *Leaf* erect, oblong-acute, tapering towards the base, 6–8 inches long, greatest width 8-10 lines. *Scape* erect, twice the length of the leaves, bearing an oblong crowded raceme 1–2 inches long; lower pedicels horizontal or pendent, 2-3 lines long, decreasing in length upwards; uppermost flowers sessile. *Bracts* minute, membranaceous, lanceolate. *Perianth* in perfect flowers purple, 2-3 lines long, deciduous, campanulate, angular at the base, not contracted at the throat, limb divided into six short-ovate connivent lobes. Upper flowers azure-blue, tubular, sessile, barren. *Stamens* six, arising from the middle of the tube of the perianth, included. Anthers adnate, bluish. *Ovary* deeply three-lobed, slightly rugose on the surface, three-celled, each cell containing two large flattened ovules superposed. *Style* one, tapering, as long as the ovary, included. *Stigma* entire

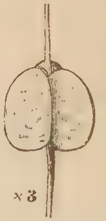
Fruit membranaceous, three-celled. *Seeds* two in each cell, large, compressed, testa brown.

The habit and general appearance of this plant are so entirely those of the species of *Botryanthus* or *Muscari*, Kunth, that some doubt may well be entertained as to whether this may not be merely a variety of one of the species of one or other of those genera. If so, the validity of the genus *Bellevalia*, as distinct from the above-mentioned, will be much impaired. In the meantime, as the present plant agrees entirely with the genus *Bellevalia* in the characters derived from the perianth and reproductive organs, no other course seems open than to consider it a new species of that genus.









Contributiones ad Acaciarum Australiæ Cognitionem. By Dr. FERDINAND MUELLER, Government Botanist, and Director of the Melbourne Botanic Garden, Victoria. Communicated by GEORGE BENTHAM, Esq., V.P.L.S., with notes on the new species.

[Read May 6th, 1858.]

[DR. MUELLER's contributions are not only valuable for the number of new and well-marked species which he has added to this extensive and polymorphous genus, but still more so for the additional characteristic notes which enable us more or less to complete our knowledge of many species previously published from specimens so incomplete that they could scarcely be recognized. And there is still very much that is doubtful, chiefly from the difficulty of procuring specimens in fruit, or, when procured, of matching them with certainty with the flowering specimens. In so far as the specimens have admitted of it, I have, at Dr. Mueller's request, carefully compared his species with those nearly allied to them, and added any remarks which suggested themselves, at the end of his descriptions. In the few cases where I clearly identified them with others previously described, I have given the published names, adding his manuscript ones for the purpose of reference, and retaining his characters as completing our previous knowledge of the plants. The following general observations by Dr. Mueller were contained in the letter to Sir W. Hooker, which accompanied this paper.—G. B.]

The Uninerves, although comprising such a large array of species in the southern latitudes of Australia, are exceedingly rare within the tropics. Indeed, only two desert plants of wide range, *A. Sentis* (doubtfully combined by Mr. Bentham with *A. decora*) and *A. salicina*, Ldl., accompany some of their usual companions as far as North Australia; and only a solitary new one, allied to *A. elliptica*, was observed in the Gregorian journey. Those of this group, which extend to subtropical latitudes in East Australia, are for the greater part identical with southern forms (for instance, *Acacia falcata*, *penninervis*, *suaveolens*, *oleifolia*); still *A. podalyrifolia* and *A. prominens*, from Moreton Bay and Wide Bay, are not to be found in Australia Felix. The plant referred by Mr. Bentham, in the 'Linnæa,' to the last-mentioned species, is assuredly distinct, and probably *A. lunata*, Sieber. A new species, of this section, allied to *A. vestita*, seems to be restricted to the warmer parts of the east coast, while my southern collections exhibit three other unknown kinds. I feel very reluctant to combine our common *A. reclinata* with what I assumed to be *A. leprosa*, which is with us a rare species, occurring towards the sources of the Yarra. Unfortunately, many kinds ripen the fruits so rarely, that one of the best specific characters for distinction in this genus also remains often beyond avail. *A. imbricata*, from Spencer's Gulf, belongs to the Uninerves, not to *A. conferta* amongst *Brunioideæ*, which I noticed near Wide Bay. The habitat "Ponindi," mentioned under *A. verniciflora* in the 'Linnæa,' vol. xxvi., belongs to *A. dodonæifolia*, Bauer having, no doubt, collected it on the very spot, near Port Lincoln. *A. salicina* is remarkable for the scarlet arillus which surrounds the seed,—a character in which, as far as I know, only *A. melanoxylon* participates. *Acacia gladiiformis* and *A. hakeoides* seem combinable. Nearly related to them is *A. notabilis*, a desert plant of Spencer's Gulf and Lake Torrens, but scarcely referable to *A. obtusata*, Sieb., a mountain-plant of East Australia. I venture also to deviate from Mr. Bentham's opinion when he unites *A. microcarpa* (singular for the smallness of its fruit) with *A. buxifolia*; for the figure in Sir W. Hooker's 'Icones Plantarum' seems to exhibit something very different.

The section Brachybotryæ is not well represented in the tropics. We observed of it, in Mr. Gregory's expedition, only two new species,—one with winged fruit, the other an *Acacia* from N.W. Australia, mentioned by Mr. Bentham under *A. melanoxylon* as imperfectly known from Cunningham's collection, and of which a full description will be found in the accompanying pages. Both show the rather unusual character amongst phyllodineous *Acaciæ*, of being deprived of the strophiolum. *A. complanata* and *A. venulosa* are not found beyond the warmer parts of East Australia. Unless imperfect specimens misled me in judging, I may pronounce that *A. pendula* and *A. sclerophylla* extend through Central Australia to Arnhem's Land, where *A. translucens* was likewise noticed. We possess a common desert-plant in South Australia and Australia Felix, enumerated in the 'Linnæa' (1856) as *A. elongata*; it seems to me not identical with the Blue Mountain plant, which I have compared, but rather to belong to *A. viscidula*. *A. multinervia* is found rarely in this colony; but quite common is *A. homalophylla*, from Lake Torrens to the Darling and Murray, where *A. stenophylla* likewise occurs. In a retrospective view it will be seen that 64 well-marked species alone occur in the collections of the North Australian Expedition, of which, after a patient scrutiny, I am obliged to admit 33 as new. By a further addition of some unpublished extratropical kinds, already contained in my former collections, the number of Australian Acacias becomes advanced to beyond 300, notwithstanding that some reductions of former species have been effected on this occasion. Most singular is the vast preponderance of *Juliferæ* in N. Australia, being nearly equal in number to those of all other sections collectively. Only 4 desert-species traverse Australia from south to north; and 8 only have hitherto been traced from Western Australia into the south-eastern portion of this continent. If, on the contrary, I rightly unite *Acacia cuspidata* with *A. diffusa*, not one of the Tasmanian species shows itself restricted to that island, except *A. axillaris*.

Mr. Gregory observes that no pinnate-leaved *Acacia* is harboured by the interior of West Australia.

Series I. *Phyllodineæ.*

§ 1. *Aphyllæ.*

1. Acacia spinescens, *Bth. in Hook. Lond. Journ. of Bot.* i. p. 322, pl. 2.

Ad sinum Spencer's Gulf, *C. Wilhelmi*. Ad sinum St. Vincent's Gulf, prope montes Barossa Range. Ad flumen Onkaparinga.

Legumina glabra coriacea valde curvata fusca basi acuta apice obtusa enervia tenuiter marginata, intus continua inter semina valde contracta, $1\frac{1}{2}''$ longa v. breviora, $1\frac{1}{2}'''$ latitudine vix excedentia. *Semina* turgide ovata $1'''$ tantum longa nitentia sordide obscuro-fusca utrinque areola cinerascenti notata. *Strophiolum* pallidum cymbiformi-acuminatum dimidium semen saltem æquans.

§ 2. *Alatæ.*

2. Acacia Muelleri, *Benth. in Linnæa,* xxvi. p. 603. (Acacia megaphylla, *Ferd. Mueller,* MS.)

In ditione districtus Portus Lincoln, *C. Wilhelmi.*

Phyllodia crasso-coriacea raro oblongo-lanceolata. *Capitula* læte lutea. *Calyx* $1'''$ circiter longus glaber campanulato-cylindraceus; dentes breves triangulares *conniventes. Petala* lanceolato-linearia inferne cohærentia. *Legumina* coriacea fusca compressa oblonga ad crassum marginem flexuosa oligosperma circ. $1\frac{1}{2}''$ longa, fere $\frac{1}{2}''$ lata, in stipitem brevem contracta, intus continua. *Semina* compresso-ovata e sordide cano et nigro variegata. *Strophiolum* lividum cymbiformi-lanceolatum acuminatum in funiculum longissimum varie implexum rufum transiens.

[In publishing this species as *A. Muelleri,* I stated my reasons for not adopting Dr. Müller's manuscript name, which appeared to me too little appropriate in a genus which contains so many species with phyllodia twice or three times as large.—G. B.]

§ 3. *Armatæ.*

3. Acacia armata, *R. Br. in Ait. Hort. Kew.* ed. 2. vol. v. p. 463.

Ad sinum Spencer's Gulf, *C. Wilhelmi.*

§ 4. *Triangulares.*

4. ACACIA PRAVIFOLIA, n. sp. Puberula, *ramulis* rigidis *spinescentibus* teretibus striatis, stipulis brevibus setaceis v. subulatis deciduis, phyllodiis parvis triangularibus crasso-coriaceis paucinerviis acutis mucronatis, angulo superiore valde protracto obtuso eglanduloso, capitulis subsessilibus v. breviter pedunculatis axillaribus solitariis, *bracteolis magnis subcordatis,* sepalis spathulatis diu cohærentibus corollam dimidiam æquantibus margine ciliolatis, *leguminibus pubescentibus spiraliter contortis.*

In montibus Flinders et Elder's Range, et ad Crystal Brook.

Phyllodia $1\frac{1}{2}$–$3'''$ longa et lata, iis *A. decipientis* non absimilia, nervo infimo magis prominente. *Flores* $1'''$ longi. *Calyx* satis laxus. *Legumina* circ. $1\frac{1}{2}'''$ lata.

Illustris Bentham forsan optime judicans hancce speciem cum sua *A. sublanata* combinat, tacens autem de bracteolarum indole et ramorum rigiditate pungente. Nec vidit pedunculorum brevitatem. *Le-*

gumina pæne cincinnata contorta affinitatem cum *A. obliqua* et *A. acinacea* demonstrant.

[Dr. Mueller's specimens were so very imperfect, that I was unable to detect any specific difference between them and *A. sublunata*. The branches in Bauer's specimen are not pungent; but they are almost as stiff as in Mueller's, and they may not unlikely become pungent. The bracts, however, in Bauer's plant certainly are not such as Müller describes them; they are broad at the base, with a narrow subulate point as long as the flower.—G. B.]

5. Acacia obliqua, *All. Cunn. ex Benth. in Hook. Lond. Journ.* i. 334.

Prope montes Buffalo Range. Ad sinum St. Vincentii alibique in colonia South Australia.

Frutex pluripedalis, ramis sæpe arcuatis. *Ramuli* plurimi conspicue angulati. *Calyx* 5-partitus corollæ dimidium subæquans, laciniis spathulato-linearibus. *Legumina* fuscescentia ætate fere nigrita tenui-coriacea insigniter cincinnato-spiralia stipitata enervia circiter $1\frac{1}{2}'''$ lata. *Semina* subfusco-nigrescentia fere reniformia nitentia $2'''$ longa breviter pallide strophiolata.

Variat glabra et pubescens.

6. Acacia pravissima (*Ferd. Mueller, First Gen. Report*; *Benth. in Linnæa*, xxvi. p. 608, *adnot.*). Arborescens, glaberrima, virens, ramulis gracilibus angulosis, stipulis perminutis subulatis v. obliteratis, phyllodiis parvis tenui-coriaceis oblique triangularibus v. trapezoideis mucronulatis opacis imperfecte binerviis venosis supra basin glandulam gerentibus, angulo superiore rotundato-obtuso, racemis polycephalis phyllodia longe superantibus summis paniculam constituentibus, bracteis minutis cymbiformi-deltoideis, capitulis paucifloris, bracteolis rhomboideis fimbriatis, calyce obtuse 5-dentato petalis fere triplo breviore, leguminibus compressis linearibus tenuicoriaceis obtusis breviter stipitatis fuscescentibus enerviis margine repandis intus continuis, seminibus nigritis compresso-ovatis minutim livide strophiolatis vix areoligeris.

In vallibus et ad torrentium ripas tractus Buffalo Range et secus partes superiores fl. Snowy River.

Arbuscula v. *frutex* pulcherrimus flexilis altitudinem 20' attinens. *Cortex* sordide fuscus lævis. *Rami* sæpe recumbentes. *Ramuli* elongati adscendentes. *Phyllodia* utplurimum $3–4'''$ rarius ad $6'''$ longa et lata, sessilia, nervis antice evanescentibus, supero tenuiore. *Racemi* jam ante anthesin 1–2-unciales. *Flores* tantum e residuis annotinorum descripti. *Legumina* bipollicaria v. breviora, $2'''$ lata. *Semina* sesquilineam metientia.

Stirps quam maxime memorabilis, species triangulares, quibuscum phyllodiis convenit, cum quibusdam sectionis uninerviarum inflorescentia convenientium (e. g. *A. vestita*, *A. cultriformi*, et *A. scapuliformi*) conjungens. Anth. vere.

[This will probably prove a very distinct species, if more perfect specimens show the inflorescence to be normal. The capitula appear to be reduced to a single flower each, and are arranged in a simple raceme; but it is not impossible that the whole may be a monstrous or abnormal elongation of the axis of a single capitulum.—G. B.]

7. ACACIA STIPULOSA, n. sp. Glanduloso-pubescens, ramulis teretiusculis, *stipulis persistentibus setaceis inferne connatis* ciliolatis, phyllodiis confertis parvis oblique lanceolatis curvatis mucronatis tenuiter plurinerviis, margine supero prope medium glanduligero, pedunculis axillaribus solitariis monocephalis phyllodium superantibus capitulis globosis multifloris puberulis, bracteolis acutissimis, *sepalis* liberis linearibus obtusis *corollæ subæquilongis,* leguminibus coriaceis latolinearibus hispidulis curvatis sessilibus intus subcontinuis inter semina non contractis, seminibus ovatis leviter compressis lucenti-nigris utrinque impressis strophiolo pallido plicato triplo breviore suffultis.

Secus partes australes fluminis Victoriæ. *Hb. M.* No. 71.

Phyllodia 1½–3‴ longa, 1–1½‴ lata, mucrone tenui terminata. *Stipulæ* 1–1½‴ longæ. *Capitula* læte lutea. *Corolla* vix 1‴ longa. *Legumen* circiter sesquipollicare acutum, 3‴ latum, satis compressum dilute fuscum. *Semina* 1½‴ longa.

Huc pertinere videtur *A. deltoidea β. pungens*, Bth. *l. c.* p. 333, vix autem varietas primaria *Cunninghami.*

[This plant differs from the true *A. deltoidea* chiefly in the hairy pod; it is also generally more downy; but I have still considerable doubts whether it will not prove a mere variety of *A. deltoidea.*—G. B.]

8. Acacia Gunnii, *Benth. in Hook. Lond. Journ.*, i. p. 332; *J. D. Hook. Fl. Tasman.*, t. xviii. (A. vomeriformis, *A. Cunn. ex Bth. l. c.*)

In montibus ad sinum St. Vincent's Gulf et coloniæ Victoriæ, e. g. Grampians, Mount Alexander, &c.

§ 5. *Pungentes.*

9. Acacia latipes, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 334. n. 40.

Ad sinum Spencer's Gulf, *C. Wilhelmi.*

Quidem nec flores nec fructus vidi; speciem autem phyllodiorum forma facile recognitam hac occasione nolui præterire.

10. ACACIA PHLEBOCARPA, n. sp. Fruticosa, viscidula, parce puberula, mox glabrata, ramulis teretiusculis, phyllodiis patentibus angusto-lanceolatis acutis subsessilibus breviter mucronatis basi minute glanduligeris multinerviis æquilateris, nervo mediano prominente, stipulis triangularibus acuminatis, pedunculis axillaribus solitariis monocephalis phyllodio parum v. dimidio brevioribus, sepalis oblongo-linea-

ribus obtusis demum liberis vix corollæ dimidium æquantibus, legumine fuscescente coriaceo arcuato acuto subsessili marginato compresso venoso imperfecte oblique septato, seminibus nitenti-nigris ovato-rotundis leniter compressis areolam circularem utrinque gerentibus strophiolo bilobo pallido basi amplexis.

Hab. In locis petræis ad ortum fluvii Seven Emu River sinus Carpentariæ. No. 41.

Frutex 2–5'. *Phyllodia* rigidula 1–1½" longa, 1½–2½''' lata. *Pedunculi* crassiusculi. *Flores* glutinosi 1''' paulo excedentes. *Legumina* 1–2" longa, circiter 2''' lata. *Semina* 1⅓''' longa.

[Closely allied to *A. cochlearis*, Labill. The phyllodia are rather thicker; the nerves, especially the lateral ones, less distinct; the minute brown stipules are broader, and the pod broader, thicker, with a more thickened margin, and much curved, that of *A. cochlearis* being nearly straight.—G. B.]

11. Acacia colletioides, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 336. n. 46.

Ad sinus St. Vincent's Gulf and Spencer's Gulf.

Legumen arcuatum v. cyclicum tenui-coriaceum 1–1½" longum, circiter 2''' latum, extus sordide fuscum, intus continuum sessile acuminatum. *Semina* obscure fusca nitentia ovato-globosa turgida 1''' paulo excedentia strophiolo cymbiformi fuscescente prædita.

12. ACACIA SICULÆFORMIS (*Cunn.*; *Benth. in Lond. Journ. Bot.* i. p. 337.—Acacia patens, *F. Muell.* MSS.). Glabra, erecta, ramulis teretiusculis, *phyllodiis reverso-patentibus* coriaceis angusto- et oblique lanceolatis basi angustatis apice acutis mucronatis uninerviis indistincte venulosis prope basin et juxta medium obscure glanduligeris, stipulis minutis agglutinatis lanceolato-subulatis, pedunculis axillaribus solitariis phyllodia paulo superantibus monocephalis, capitulis globosis multifloris, leguminibus chartaceis linearibus rectis compressis enerviis spadiceis gracili-stipitatis intus continuis ad suturas flexuosis, *seminibus* ovatis leniter compressis minutissime strophiolatis obscure fuscis nitidis.

Ad rivos Hooker's et Sturt's Creek. No. 4.

Phyllodia 4–10'''' longa, 1–1½''' lata. *Flores* evoluti desunt. *Legumina* 1–1½''' longa et totidem lineas lata tenuiter marginata. *Semina* 1''' paulo excedentia.

A. diffusæ proxima.

Alteram hujus sectionis speciem tropicam et probabiliter *A. siculæformi* proximam absque floribus fructibusque vidi in montibus inter flumen Suttor et planitiem Peak Downs sitis.

[F. Mueller's specimens of *A. patens* appear to agree in every respect with the original ones of *A. siculæformis*.—G. B.]

13. Acacia Stuartiana, *Ferd. Muell. et Benth. in Linnæa*, xxvi. p. 609; *J. D. Hook. Fl. Tasman.* p. 104, t. 19.

Frutex orgyalis amplus v. humilior. *Semina* ovata satis turgida 1''' paulo longiora e spadiceo nigrita lucida.

14. Acacia cuspidata, *All. Cunn. ex Benth. in Hook. Lond. Journ.* i. p. 337. n. 51.

Haud rara in colonia Victoriæ.

Legumina lato-linearia leniter compressa parum curvata fusca enervia marginata breviter stipitata acuminata $1\frac{1}{2}$-3'' longa, 2''' lata v. paulo latiora ad suturas recta intus continua, valvis coriaceis chartaceis. *Semina* atra vix nitidula ovata leniter compressa $1\frac{1}{2}$–2''' longa, strophiolo brevi crassiusculo sordide fulvescente suffulta.

15. Acacia Brownii, *Steudel, Nomencl. Bot.* i. p. 2.

Variis locis in Australia Felice.

Legumina chartacea dilute fusca. *Semina* nitida nigro-spadicea $1\frac{1}{2}$''' longa ovata leniter compressa strophiolo brevi fulvescente prædita.

16. Acacia rupicola, *Ferd. Mueller ex Benth. in Linnæa* xxvi. p. 610.

In montibus Lofty Range et ad flumen Bremer.

Legumina bipollicaria vel breviora circiter 2''' lata fuscescentia compressa coriacea plus minusve curvata indistincte venulosa intus continua, basi stipitato-attenuata. *Semina* nigro-fusca nitidula circiter 2''' longa compresso-ovata strophiolo pallido majusculo prædita.

17. Acacia sphacelata, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 338. n. 34. (A. tetragonophylla, *Ferd. Muell.* No. 6.)

In pascuis siccis subsalinis ad lacum Torrens.

Frutex divaricato-ramosissimus, raro arbuscula. *Rami* validi cano-nigrescentes. *Phyllodia* $\frac{3}{4}$-$1\frac{1}{2}$'' longa, $\frac{1}{2}$-1''' lata. *Pedunculi* axillares solitarii vix semunciales. *Sepala* linearia obtusa prorsus libera et distantia, corollæ dimidium æquantia apice non nigrescentia. *Bracteolæ* spathulato-lineares. *Legumina* sessilia compressa valde curvata marginata.

Specimina dubie huc relata, a cl. Bentham ad *A. Brownii* reducta.

18. Acacia ovoidea, *Benth. in Hook. Lond. Journ.* i. p. 339, f. ; *Hook. Flor. Tasman.* p. 105. t. xx.

In paludosis et irriguis coloniæ South Australia affatim occurrens. In terra Gipps Land et aliis partibus coloniæ Victoriæ minus frequens quam *A. verticillata.*

19. Acacia verticillata, *W. Sp. Pl.* iv. p. 1049.

γ. *cephalantha*, phyllodiis tenuissimis setaceo-subulatis, spicis depauperatis ad capitula subglobosa reductis, calycibus corolla ter quaterve brevioribus.

Ad umbrosas subsalinas fluvii Yarra.

Varietas insignis solo peculiari orta clare in formam normalem transiens.

20. Acacia Riceana, *Henslow in the Botanist,* iii. p. 135.

In silvis densis montium ad Sealers' Cove.

Antea tantum in Tasmania reperta.

§ 6. *Calamiformes.*

21. Acacia pinifolia (*Benth. in Mitch. Subtrop. Austr.* p. 342.—*Acacia tenuissima*, n. sp.). Glabra, ramulis teretiusculis, phyllodiis tenuissimis elongatis tetragono-filiformibus curvato-mucronulatis, stipulis minutis deltoideis diu persistentibus, pedunculis brevibus solitariis monocephalis, leguminibus chartaceis lato-linearibus rectis compressis marginatis enerviis ad suturas vix flexuosis breviter stipitatis basi et apice acutis.

In locis lapidosis aridis ad originem fluvii M'Arthur sinus Carpentaria Gulf. No. 5.

Frutex 5–8′. *Phyllodia* 3–8″ longa, $\frac{1}{4}$–$\frac{1}{2}$‴ tantum crassa. *Flores* desunt. *Pedunculi* leguminigeri fere semunciales. *Legumina* 2–4″ longa, 1$\frac{1}{2}$–2$\frac{1}{2}$″ lata. *Semina* matura deficiunt.

Num eadem sit ac *Acacia pinifolia* (Bentham in Mitchell, Trop. Austr. p. 342) comparatio speciminum docebit.

[These specimens are in fruit; Mitchell's were in flower; but they appear in other respects identical. Dr. Mueller had inadvertently given the name of *A. tenuissima* to two species; but the present one proving to be already published, his name will be retained for the one described below (No. 74).—G. B.]

22. Acacia chordophylla, *Ferd. Muell. ex Benth. in Linnæa*, xxvi. p. 612.

Ad fluvium Murray.

Corolla calycem ciliolatum semisuperans. *Legumen* 1$\frac{1}{2}$–2″ longum et totidem lineas latum chartaceum dilute fuscum inter semina flexuoso-constrictum. *Semina* ovata *nitenti-fusca* leviter compressa 1$\frac{1}{2}$‴ longa strophiolo livido fere 1‴ metiente suffulta.

A. ephedroidi inter *Juliferas* valde cognata.

23. Acacia leptoneura, *Benth. in Hook. Lond. Journ.* i. p. 340. n. 64.

Ad sinum Spencer's Gulf, *C. Wilhelmi.*

Frutex laxus ramosissimus pluripedalis. *Phyllodia* in speciminibus cultis multo longiora et magis compressa quam in spontaneis *A. chordophyllæ,* abs quo etiam differre videtur corolla calycem paulo nec semisuperante. *Pedunculi* capitulo æquilongi appresso-puberuli.

24. Acacia sericophylla, n. sp. Subsericeo-puberula, ramis teretiusculis, phyllodiis filiformi-linearibus elongatis muticis subtilissime striolatis, floribus . . . . , leguminibus coriaceis elongatis curvatis torulosis inter semina conspicue constrictis extus tenuissime cano-puberulis.

In eremo ad flumen Suttor.

Phyllodia 5–8‴ longa, 1‴ lata, compresso-filiformia canescentia. *Legumen* circiter semipedale circiter 4‴ latum. *Semina* et flores nondum visa.

Species *A. calamifoliæ* proxima.

[Of this I have seen no specimen.—G. B.]

25. Acacia nematophylla, *Ferd. Muell. ex Benth. in Linnæa*, xxvi. p. 612.

Spencer's Gulf, *C. Wilhelmi.*

Legumina pluripollicaria, circiter 3''' lata, coriacea corrugata, demum fuscescentia, satis compressa, ad suturas flexuosa. *Semina* atra opaca ovata v. oblongo-ovata satis compressa strophiolo crasso fulvido fere cymbiformi 1''' longitudine excedente suffulta.

Acacia Wilhelmiana[*], a cl. Bentham, *l. c.*, cum *A. nematophylla* conjuncta mihi satis singularis videtur visciditate, phyllodiis brevioribus obtusioribus et leguminibus multo minoribus vix 1½''' latis. Ceterum vidi nulla hujus speciei exemplaria nisi imperfecta.

Frutex orgyalis satis amplus.

Specimina cujusdam *Acaciæ* ad sinum Spencer's Gulf a C. Wilhelmi collecta, phyllodiis *A. calamifoliæ* simillima legumine compresso (etsi magis recto et vix flexuoso) ad *A. nematophyllam* accedens, aut hujus format varietatem insignem aut potius speciem propriam phyllodiis longioribus acutioribus, legumine fere chartaceo et strophiolis angustioribus singularem.

§ 7. *Brunioideæ.*

26. Acacia lycopodifolia, *All. Cunn. in Hook, Ic.* ii. t. 172.

In clivis petræis ad flumen Victoriæ.

Frutex 2–3' diffusus. *Rami* cano-pubescentes. *Flores* puberuli. *Calyx* corolla breviter 5-loba fere quater brevior, acute dentatus. *Bracteolæ* diu persistentes angusto-lanceolatæ v. lineares acutissimæ ciliatæ circiter 1''' longæ. *Legumina* sessilia 1–1½'' longa circ. 2½''' lata marginata fusca. *Semina* pauca v. plura, immatura late ovata nigrita compressa strophiolo cymbiformi triplo breviore livido prædita.

27. Acacia galioides, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 344.

In præruptis rupestribus ad flumen Victoriæ.

Frutex humilis. *Bracteolæ* lanceolatæ acutissimæ ciliolatæ infracto-unguiculatæ. *Calyx* triente corollæ pubescentis paulo longior acute dentatus. *Legumina longe stipitata* valde compressa fuscescentia marginata parce viscidulo-puberula bipollicaria vel breviora, vix 3''' lata, transverse plus minus impressa. *Semina* 10 v. pauciora, immatura iis *A. lycopodifoliæ* similia.

28. ACACIA ASPERULACEA, n. sp. Glabra v. pubescens, ramulis tenuibus teretiusculis, stipulis lanceolato-linearibus subulatis subappressis, phyllodiis verticillatis teretiusculis subcanaliculatis apice recurvis mucronulatis, pedunculis phyllodia superantibus, capitulis multifloris, bracteolis unguiculatis lanceolato-linearibus acutissimis, calycis 5-fidi dentibus acutissimis, corolla 5-loba striolata calycem fere duplo superante, leguminibus rectis lato-linearibus sessilibus compressis

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[*] Ferd. Mueller, in Transact. Phil. Society Victoria, p. 37.

basi et apice acutis marginatis fuscis lævibus continuis, seminibus . . . .

In plaga petræa (Sandstone table-land) terræ Arnhemicæ et ad flumen Victoriæ. Hb. M. 1 & 73 partim.

Rami adscendentes. *Phyllodia* 2–4‴ longa, in quoque verticillo 8–14. *Stipulæ* lineam metientes v. breviores. *Capitula* 3–4‴ diametro tenentia nec ut in *A. Baueri* minima. *Legumina* circiter 1½″ longa, 2‴ lata.

[Closely allied to the *A. Baueri*, of which it has the foliage; but the heads of flowers, as well as the flowers themselves, are twice the size. —G. B.]

29. ACACIA SUBTERNATA, n. sp. Glabra, ramulis angulatis sulcatis junioribus innovationibusque viscidulis, stipulis minimis v. obliteratis, *phyllodiis* lineari-filiformibus compressis ut plurimum *ternatim confertis* rarius geminis sparsisve brevissime recurvo-cuspidatis, pedunculis solitariis phyllodia superantibus, capitulis multifloris glabris, calycis corolla semibrevioris 5-partiti laciniis spathulato-linearibus obtusis, legumine plano crasso-coriaceo marginato lanceolato sensim in basin longe angustato oblique striato et oblique septato, seminibus . . . . . .

In plaga elevata petræa terræ Arnhemicæ ad flumina Victoriæ (No. 73 partim), *Roper et Limmen*; Bight River.

Frutex 3–5′. *Phyllodia* 3–6‴ longa, vix ½‴ lata. *Corollæ* 5-fidæ circ. 1‴ longæ. *Legumina* addito stipite 1½–2″ longa, 2–2½‴ lata.

Species insignis, quintæ seriei Juliferarum quoad legumina approximans, ceteroquin ad *Brunioideas* certe pertinens.

[Appears to be a good species. The arrangement of the phyllodia (should it prove constant) is singular: they are neither verticillate, as in the *Brunioidea verticillata*, nor solitary at each node, as in the *Brunioidea sparsifolia*; but in most cases in fascicles of 2, 3, or 4 from each node, something like the leaflets of *Aspalathus*.—G. B.]

30. Acacia conferta, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 345.

Near Balmy Creek and near Mount Mereval, *Sir T. H. Mitchell*. In collibus ad flumen Dawson; *Ferd. Mueller*, No. 2.

Frutex 1–2-orgyalis: *Phyllodia* semuncialia v. breviora marginulata (nullo modo ut habet cl. Bentham margine revoluta) in speciminibus suppetentibus acuta. *Calyx* 5-fidus, lobis obtusis. *Legumina* 1–1½″ longa, circiter ½″ lata, valde compressa, coriacea, pruinosa, ad suturas flexuosa, oligosperma. *Semina* 2‴ longa opaco-nigra non areolata, strophiolo sublivido 1‴ longo cymbiformi sustenta.

§ 8. *Uninerviæ.*

31. Acacia dictyocarpa, *Benth. in Linnæa*, xxvi. p. 616.

In virgultis ad flumina Hutt et Hill River, prope St. Vincent's Gulf.

ad flumina Darling, Murray, et Murrumbidgee, in virgultis, ad lacum Alexandrinæ.

Frutex speciosus 3–5′. *Semina* 1½–2‴ longa opaca atra compresso-ovata, areola laterali conspicua. *Strophiolum* lividum cymbiforme longe acuminatum dimidium seminis paulo excedens.

32. Acacia argyrophylla, *Ferd. Mueller, Coll. Bot.* 1847 et seq.

Ad flumen South Rhine in virgultis.

Frutex pluripedalis amplus. *Legumina* nigrescentia iis *A. dictyocarpæ* latiora.

33. Acacia podalyrifolia, *A. Cunn. in G. Don, Gen. Syst.* ii. p. 405. n. 85.

Wide Bay, *Moore*; Burnett River, Dawson River, on ridges, *Ferd. Mueller*, No. 16.

Frutex altior. *Legumen* subsessile tenui-coriaceum oligospermum complanatum glaucum puberulum 1½–3″ longum, ½–¾″ latum, marginatum venosum flexuosum, inter semina contractum. *Semina* nigra ovata satis compressa circiter 2½‴ longa opaca, strophiolo crasso fulvido triplo breviore suffulta.

Variat foliis lato-ovatis obtusis et angusto-lanceolatis acutis.

34. Acacia oleifolia, *All. Cunn. in Don, Gen. Syst. Dichlam. Plants*, ii. p. 405.

Wild Dog Creek, near Mount Remarkable. In virgultis ad flumina Dawson, Burdekin, et Burnett River. No. 22.

Capitula reperi pluriflora. *Legumina* subnigrescentia stipitata ut plurimum 1½–2″ longa lævia. *Semina* lucenti-nigra leviter compressa ovata, areolis valde indistinctis. *Strophiolum* crassum lividum semine triplo brevius.

Variat phyllodiis sesquilineam latis et fere 2″ longis falcatis.

35. Acacia lunata, *Sieb. in DC. Prodr.* ii. p. 452.

In montibus sterilibus dumosis ad flumen Ovens, et in montibus Buffalo Range.

Corolla calycem sinuato-dentatum vix ciliolatum pluries superans.

Specimina e locis supra memoratis cl. Bentham, *l. c.*, partim dubie ad *A. buxifoliam* partim ad *A. prominentem* retulit.

36. Acacia myrtifolia, *Willd. Sp. Pl.*

Frequens in coloniis South Australia et Victoria.

37. Acacia iteaphylla, *Ferd. Mueller ex Benth. in Linnæa*, xxvi. p. 617.

β. latifolia, phyllodiis latioribus et brevioribus.

Ad sinum Spencer's Gulf, *C. Wilhelmi*; *Ferd. Mueller*. Ad ostium fluminis Murray, *Wuerth*.

Frutex orgyalis et altior amplus. *Semina* ovata leviter compressa haud areolata 2‴ longa nitidulo-nigra. *Strophiolum* seminis dimidium æquans fulvescens angusto-cymbiforme. Glandula *phyllodii* interdum a basi distans.

38. Acacia pycnantha, *Benth. in Hook, Lond. Journ.* i. p. 351.

Frequens in coloniis South Australia et Victoria.

Arbuscula v. *frutex* altior. *Legumina* recta obscure fusca coriacea lato-linearia marginata 2‴ circiter lata, 1½–3″ longa, inter semina quasi articulatim impressa, intus continua, ad suturas non aut parum flexuosa. *Semina* circiter 1½‴ metientia oblongo-ovata compressa nitenti-nigra, areola inconspicua. *Strophiolum* cymbiforme acuminatum lividum seminis dimidium superans.

39. Acacia falcata, *Willd. Sp. Plant.* iv. p. 1053.

Ad flumina Brisbane, Burnett, et Dawson River.

40. Acacia penninervis, *Sieb., ex DC. Prodr.* ii. p. 452.

Ad flumina Burnett et Brisbane Australiæ orientalis subtropicæ. No. 13, 14. Broken River! in montibus graniticis ad Snowy River!

Legumina pallide ætate saturate fusca coriacea plana 2–5″ longa, semunciam circiter lata venosa intus continua. *Semina* longitudinalia circiter 2½‴ longa nitenti-atra non areolata ovata leviter compressa. *Strophiolum* obscure lividum cymbiforme acuminatum semini æquilongum. *Funiculi* pars superior crassa plicata.

41. Acacia retinodes, *Schl. Linnæa,* xx. p. 664.

In coloniis South Australia et Victoria non rara.

Frutex altior vel arbor parva. *Legumina* coriacea dilute fusca paulo pruinosa lato-linearia compressa recta stipitata 2–4″ longa, circiter 3‴ lata, venulosa, intus continua, ad suturas vix flexuosa. *Semina* oblonga ovata compressa nigra vix nitentia 1½‴ longa. *Strophiolum* lividum crassiusculum cymbiforme semine aliquoties brevius.

42. Acacia salicina, *Lindl. in Mitch. Three Exped.* ii. p. 20.

In terra Arnhem's Land, *e. g.* ad flumen Roper, *hb. M.* 12. In eremo ad flumen Suttor, No. 21.

Corolla calycem glabrum triplo superans. *Legumina* plus minus curvata pallida paulo pulverulenta circiter ½″ lata intus continua. *Semina* subrotunda v. late ovata compressa splendenti-nigra lævia 2‴ metientia strophiolum coccineum longissimum flexuosum et varie plicatum gerentia.

β. *minor,* phyllodiis et leguminibus conspicue minoribus.

Spencer's Gulf, *C. Wilhelmi*; St. Vincent's Gulf.

43. Acacia hakeoides, *All. Cunn. ex Benth. in Hook. Lond. Journ.* i. p. 354. (A. gladiiformis, *A. C. l. c.*)

In deserto ad fluvium Murray, lacum Torrens et montes Flinders Range.

Frutex 5–6. *Calyx* fimbriolatus corollam dimidiam æquans. *Legumina* fusca inter semina longe tenuiter contracta 3–4″ longa, coriacea, loculis circiter 3‴ latis turgidis. *Semina* oblongo-ovata nigra saltem 2‴ longa. *Strophiolum* pallidum cymbiforme acuminatum dimidium seminis æquans.

44. ACACIA NOTABILIS (*Ferd. Mueller*). Glabra, ramulis superne angulatis, *phyllodiis* angusto- v. oblongo-lanceolatis obtusiusculis sessilibus *crasso-coriaceis basi tantum glanduligeris* marginatis uninerviis pallidis venosis, racemis oligocephalis phyllodio brevioribus, leguminibus tenui-coriaceis nigrescentibus angusto-oblongis obtusis planis stipitatis marginatis venulosis parum pruinosis ad suturas rectis, seminibus transverse sitis nigris opacis compressis ovatis strophiolo cymbiformi livido longe acuminato dimidio longioribus areolatis.

In vicinitate portus Lincoln, *C. Wilhelmi.* Ad montes Flinders Range.

Frutex circa orgyalis. *Phyllodia* 2–4″ longa, 4–6‴ lata. *Flores* desunt. *Rachis* fructifer flexuosus. *Legumina* 1½–2½″ longa, circiter 4‴ lata intus continua. *Semina* circiter 2‴ longa.

Species eremicola dubie a clarissimo Bentham, *Acaciæ obtusatæ* montes cæruleos inhabitanti conjuncta, potius ad *A. hakeoidem* (legumine ceteroquin diversam) appropinquans.

[I have still great doubts whether this species be a good one.—G. B.]

45. Acacia rubida, *All. Cunn. ex Benth. in Hook. Lond. Journ.* i. p. 355.

In collibus petræis inter montes May-day Hills et flumen Ovens. In regionibus montanis graminosis ad flumina King et Delatite. In clivis saxosis ad fluvium Snowy River.

Arbuscula v. frutex.

46. Acacia crassiuscula, *Wendl. Comment. de Acaciis aphyll.* p. 31, t. 8.

β. *angustifolia,* Benth. in Linnæa, xxvi. p. 619.

Ad flumen Snowy River.

γ. *pubescens,* phyllodiis augustioribus et brevioribus glabriusculis, ramulis et inflorescentia pubescentibus.

New South Wales.

δ. *latifolia,* phyllodiis conspicue latioribus e truncato apice oblique cuspidatis.

Snowy River.

Specimina evoluta hujus varietatis nondum vidi.

47. Acacia prominens, *A. Cunn. in Don, Gen. Syst.* ii. p. 406; *non Benth. in Linnæa,* xxiv. p. 620.

Frequens circum Moreton Bay, in montibus ad flumina Pine River et Burnett. Hb. M. no. 15.

Frutex sæpe biorgyalis. *Calyx* repando-dentatus corolla fere triplo brevior ciliolatus. *Legumen* fuscescens leniter pruinosum compressum fere biunciale fere ½″ latum stipitatum chartaceum læve inter semina plus minus contractum. *Semina* ovata leniter compressa nitidulo-nigra lævia non areolata sesquilineam longa strophiolo brevi crasso livido prædita.

48. Acacia decora, *Reichb. Icon. exot.* t. 199. (Acacia Sentis, *Ferd. Mueller.*)

In Australia centrali, *Sturt.* Ad flumen Victoriæ, *N.* 19. Secus rivos siccos terræ Arnhemicæ, No. 17. "Plains of Promise" sinus Carpentariæ, No. 20. In Australia orientali tropica.

Ramuli inermes v. ætate spinis geminis prædití. *Corolla* glabra, circiter ad trientem divisa, laciniis angustis, tubo tenui calycem semisuperante. *Calyx* profunde quinquepartitus, laciniis spathulato-linearibus apice ciliatis. *Legumina chartacea* complanata, 1–1½″ longa, circiter ½″ lata, dilute fusca, reticulato-venosa, glabra, oligosperma, inter semina plus minus margine constricta, basi acuta, apice obtusa. *Semina subglobosa* splendentia e fulvo et spadiceo variegata sesquilineam longa, strophiolo brevi carnoso fulvescente prædita.

[The specimens now sent show still more the identity of this plant with the *A. decora*, Reichb.—G. B.]

49. Acacia buxifolia, *A. Cunn. in Field's New South Wales*, p. 344.

Pine Ridges on the Macquarie River, *All. Cunn.* auctoritate illustr. *Hooker.*

β. subvelutina, ramulis innovationibus rachibusque velutinis. *Bracteolæ* rhombeo-cordatæ fimbriolatæ minutæ. *Calyx* fimbriolatus obtuse dentatus petalis fere triplo brevior. *Legumen* nigrescens pruinosum brevissime stipitatum coriaceum marginatum fere ½″ latum. *Semina* immatura fere rotunda nigra strophiolo livido prædita.

In tergis montium subalpinorum ad flumen Freestone River.

50. Acacia microcarpa (*Ferd. Mueller, Second Gen. Rep.* p. 7). Glabra, ramulis tenuibus acute angulatis, phyllodiis lineari- v. ovato-oblongis obliquis sessilibus uninerviis obscure venulosis obtusis recurvo-apiculatis infra medium glanduligeris, stipulis minutis deltoideis, leguminibus parvis tenui-chartaceis angustis pallidis arcuatis inter semina parum contractis lævibus, seminibus parvis turgide ovatis nitentibus nigro-fuscis pallide areolatis, strophiolo rotundo-ovato acuminato vix dimidium seminis æquante.

Ad margines fruticetorum ad Tumbey Bay, *C. Wilhelmi.* Ad flumina Avoca et Murray.

Frutex pauci- v. pluripedalis patentim ramosissimus. *Phyllodia* uncialia et breviora 1½–3‴ lata. *Flores* omnino desunt. *Legumina* ¾–1½″ longa, circiter 1‴ lata. *Semina* 1‴ paulo excedentia. *Strophiolum* sordide fuscescens.

Species fructus minutie valde singularis ex icone *Hook. Icon.* t. 164, cum *A. buxifolia* neutiquam jungenda.

[Of this I have now no specimen, the fragment I formerly saw having been returned to Mr. Sonder.—G. B.]

51. ACACIA IMBRICATA (*Ferd. Mueller, in herb. Wilhelmiano*). Glabra, ramulis confertis acute angulatis, stipulis obliteratis, phyllodiis parvis confertis sessilibus oblongo- v. cuneato-linearibus uninerviis aveniis *apice obtusis glanduligeris* et oblique cuspidato-apiculatis, pedunculis axillaribus solitariis phyllodia superantibus, floribus . . . ., leguminibus dilute fuscis lato-linearibus chartaceis subsessilibus ad suturas rectis leviter compressis pleio- v. polyspermis, seminibus rotundo-ovatis leniter compressis nitentibus nigrescentibus strophiolo cymbiformi acuminato fere duplo longioribus.

Tumbey Bey, Spencer's Gulf ad margines fruticetorum, *C. Wilhelmi*.

Frutex densus 3–4′ altus. *Phyllodia* crassiuscula 2–6‴ longa, ½–1‴ lata. *Pedunculi* tenues circiter semunciales. *Legumen* (a *Benthamio in Linnæa*, xxvi. p. 614, sub *A. conferta* descriptum) 1½–2″ longum, 2–3‴ latum. *Semina* fere 1½‴ longa utrinque distincte areolata.

Species certo ad uninervias pertinens, *A. lineatæ* affinis, a *Benthamio*, *l. c.*, perperam cum *A. conferta* e *Brunioidearum* serie conjuncta, quæ differt habitu multo altiore: ramis pubescentibus non distincte angulatis, phyllodiis acutis glandula terminali orbatis, nervo nullo v. indistincto præditis, satis evidenter marginulatis, legumine valde compresso multo latiore stipitato pruinoso oligospermo, ad suturas flexuoso, seminibus majoribus minus nitentibus magis compressis haud distincte areolatis et forsan quoque floribus.

[Dr. Mueller may be correct in referring this to the Uninerviæ next *A. lineata*. My specimen is too imperfect to determine the point. —G. B.]

52. Acacia acinacea, *Lindley in Mitch. East Austr.* ii. p. 267.

In parte australi coloniæ Victoriæ, a montibus Grampianis usque ad rivum Forest Creek, necnon ad portum Phillip.

Frutex pluripedalis amplus ramosissimus, ramis sæpe recurvatis. *Calyx* 5-partitus corollam vix semiæquans, laciniis lineari-spathulatis. *Legumen* spirale quasi cinnatum, ei *A. obliquæ* persimile. Transitum igitur a speciebus uninerviis ad triangulares parat.

53. Acacia aspera, *Lindl. l. c.*

In locis sterilioribus virgultorum et nemorum Australiæ Felicis; *e. g.* Grampians, Black Forest, Goulburn et Broken River.

Frutex pluripedalis valde ramosus. *Legumina* arcuata leviter compressa 1–2″ longa, vix 1½‴ lata, dilute fusca hispidula, ad suturas plus minusve flexuosa, basi et apice acuta. *Semina* nigrescentia ovata sesquilineam longa, strophiolo carnoso fulvido prædita.

54. Acacia montana, *Benth. l. c.*

Differt ab *A. leprosa* phyllodiis minoribus obscure bi- v. plurinerviis juxta basin conspicue glanduligeris, capitulis multo intensius luteis, pedunculis glabris et bracteolis brevioribus. *Flores* similes. *Corolla* 5-fida calycem obtuse 5-lobum puberulum semiæquans. *Bracteæ* ad pedunculorum basin rotundæ conspicuæ.

In collibus ad flumen South Rhine.

A. sclerophylla, Lindl., cum hac confluit, nisi fructu differt.

55. Acacia exsudans, *Lindl. in Mitch. East Australia*, ii. p. 216.

Differt ab *A. reclinata* et *A. leprosa* phyllodiis divaricatis brevioribus et obtusioribus minutim apiculatis non apice sphacelatis, nervo secundario secus marginem superum percursis, calycibus magis glabris, ab *A. leprosa* præterea glandula minore basali, capitulis minus læte luteis. *Legumina* 1-2″ longa, 1½-2‴ lata, breviter stipitata, viscoso-puberula lato-linearia recta compressa sordide fusca coriaceo-chartacea. *Semina* ovato-oblonga nitentia fusco-nigra 1½‴ metientia longe areolata. *Strophiolum* crassum breve.

56. ACACIA DINEURA, n. sp. Fruticosa, glabra, ramulis striato-angulatis, phyllodiis chartaceis angusto-oblongis v. oblongo-lanceolatis obtusis leniter falcato-curvatis *binerviis* reticulato-venosis ad basin minute glandulosis, pedunculis axillaribus monocephalis solitariis phyllodio pluries brevioribus, leguminibus complanatis stipitatis elongato-oblongis marginatis venosis, suturis leniter undulatis.

In plaga arenoso-rupestri juxta originem fluviorum Roper et Limmen, Bight River terræ Arnhemicæ, *h. M.* no. 31.

Frutex altior. *Phyllodia* 2-3″ longa, 3-8‴ lata. *Areolæ* venationis magnæ. *Pedunculi* tenues semunciam paulo excedentes. *Legumina* (immatura tantum visa) 2½-5″ longa, circiter ⅔‴ lata. *Flores* et *semina matura* nondum cognita.

A. ellipticæ, Cunn. in Hook. Lond. Journ. i. p. 347, et *A. hemignostæ* proxima.

[Appears to be a distinct species. The phyllodia are thinner and differently shaped from the few 2-nerved species known with solitary flower-heads.—G. B.]

57. ACACIA LEPROSA (*Sieb. in DC. Pr.* ii. 450). Elatior, ramulis angulatis apice vix puberulis cernuis v. nutantibus, phyllodiis chartaceis patentibus elongato- et angusto-lanceolatis leviter curvatis sphacelato-apiculatis brevissime petiolatis basi et apice longe angustatis glabris viscoso-punctatis uninerviis tenuiter reticulato-penniveniis supra basin conspicue uniglandulosis, pedunculis axillaribus geminis–quinis cano-velutinis capitulo citrino multifloro æquilongis, corolla glabra 5-fida calycem subvelutinum dentatum semisuperante, bracteolis lanceolatis, leguminibus . . . .

Ad ripas superiores fluvii Yarra-Dallachi.

Rami graciles elongati. *Phyllodia* læte viridia pleraque 3-4″ longa, 3-6‴ lata. *Capitula* suaveolentia.

58. Acacia leprosa (*Sieb. in DC. Prod.* ii. p. 450, *var.* sec. *Benth.*—Acacia reclinata, *Ferd. Mueller, First Gen. Report*, p. 12). Elatior, ramulis angulatis subglabris demum nutantibus, phyllodiis chartaceis patentibus lineari-lanceolatis sphacelato-apiculatis vix curvatis subsessilibus ima basi minutim glanduligeris basi ut apice sensim angustatis glabris viscoso-punctatis uninerviis tenuiter reticulato-penniveniis, pedunculis axillaribus geminis ternisve capitulo sulphureo multifloro æquilongis puberulis, corolla glabra 5-fida calycem dentatum puberulum semisuperante, bracteolis lanceolatis, ...

In vallibus Australiæ Felicis orientalis et litoralis.

Frutex densus altus. *Phyllodia* pleraque 1½–2½″ longa, 2–3‴ lata. *Legumen* lineare falcatum arcuatum basi et apice acutum circiter 1–2-pollicare 1½‴ latum compressum tenui-coriaceum fuscum inter semina continuum non contractum.

β. *binervis*, phyllodiis binerviis.

In collibus graniticis ad flumen Broken River.

A. leprosæ persimilis, vix tamen ejus varietas.

[I still think it a mere variety of *A. leprosa*.—G. B.]

59. Acacia dodonæifolia, *Willd. Enum. Pl. Suppl.* p. 68. (Acacia viscosa, *Schrad. in Wendl. Comment.* p. 30.—Mimosa dodonæifolia, *Persoon, Synops.* ii. p. 261.)

Ad sinum Spencer's Gulf prope Port Lincoln, *C. Wilhelmi.*

Corolla 5-partita calycem glabrum viscidum dentatum triente superans. *Bracteolæ* angustissime lineares, lamina spathulata terminatæ. *Pedunculi* solitarii v. gemini glabri capitulo longiores. *Legumina* dilute fulvida 1–4½″ longa, 1½‴ lata lato-linearia curvata viscidula satis compressa tenui-coriacea enervia intus continua inter semina haud aut vix contracta. *Semina* nitentia spadiceo-nigrescentia compresso-ovata 1½–2‴ longa, strophiolo sordide fulvido replicato basi suffulta. *Frutex* 15-20′.

Differt ab *A. reclinata* et *A. leprosa* phyllodiis distinctius venosis paulo crassioribus ratione longitudinis latioribus, obtusioribus, apiculo minuto non sphacelato terminatis prope et supra medium glanduligeris (præter glandulam basalem), pedunculis longioribus glabris sæpe solitariis, calyce glabro, corolla profundius divisa, bracteolarum forma et forsan quoque leguminibus hactenus mihi ignotis.

60. Acacia stricta, *W. Sp. Plant.* iv. p. 1052.

Kangaroo Island. Satis frequens in colonia Victoriæ.

β. *binervis*, phyllodiis binerviis. Tasmania, *Stuart.*

γ. *pleiocephala*, racemis brevibus oligocephalis.

South Port, Tasmaniæ, *Stuart.*

61. Acacia plagiophylla, n. sp. Ramulis hirtellis angulatis, phyllodiis parvis glabris triangularibus sive ovato-deltoideis sessilibus

mucronatis curvato-uninerviis subaveniis marginatis ad angulum superum obtusiusculum glanduligeris, ...

Ad flumen Brisbane, No. 25, *Hill et Muell.*

Habitu ad *Acaciam pravissimam* accedens. *Phyllodia* 2-4''' longa, 1½-3''' lata, satis obscure viridia, nitidula. *Flores* et *fructus* hactenus ignoti.

[Without further information, it will be impossible to judge of or identify this species. There are no specimens sent.—G. B.]

§ 9. *Brachybotryæ.*

62. Acacia viscidula, *Benth. in Hook. Lond. Journ.* i. p. 363. no. 141. (Acacia elongata, *Benth. in Linnæa,* xxvi. p. 624, non *Sieber.*)

Spencer's Gulf, Lake Torrens, St. Vincent's Gulf, et Murray River.

Flores minuti. *Sépala* spathulato-linearia vix ciliolata corollam semiæquantia. *Legumina* lineari-filiformia acuta sessilia 1½-2½'' longa, circiter 1½''' lata fuscata longitudinaliter venosa coriacea leniter curvata, inter semina modice contracta. *Semina* nigro-fusca nitentia 1-1½''' longa ovata vix compressa areolata. *Strophiolum* crassiusculum lividum basin seminis tantum amplexans.

A. farinosæ affinis.

63. Acacia farinosa, *Lindley in Mitchell's Three Exped.* ii. p. 146.

Ad sinum Spencer's Gulf, *C. Wilhelmi.*

Frutex ramosissimus laxus paucipedalis. *Corollæ* profunde 5-partitæ segmenta lanceolata glabra. *Sepala* libera lineari-spathulata ciliolata petalis semisuperata. *Legumina* turgida glabra spadicea circiter 2'' longa, vix ultra 2''' lata, arcuata, basi obtusa sessilia, apice longe rostrata, inter semina constricta. *Semina* ovata 1½''' longa sordide brunnea, strophiolo flavescente crassiusculo bilobo ter breviore suffulta.

64. Acacia multinervia, *DC. Legum. Mem.* p. 445.

In vicinitate montis Alexander.

Flores minuti. *Capitula* nonnunquam terna. *Calyx* 5-fidus ciliolatus. Vidi in specimine meo ramos striato-angulatos puberulos. *Stipulæ* e lata basi lineari-setaceæ demum deciduæ.

Species situ glandulæ inter affines valde distincta.

[The true *A. multinervia*, DC., is probably one of the Pungentes, as I pointed out (Linnæa, xxvi. p. 625). The plant here alluded to by Dr. Mueller, among the Brachybotryæ, is probably the one I myself formerly mistook for the *A. multinervia*,—a variety of *A. ixiophylla* with a marginal gland. I have not, however, seen any specimen from Dr. Mueller.—G. B.]

65. Acacia translucens. *All. Cunn. in Hook. Icon. Plant.* ii. t. 160.

Ad rivos Sturt's Creek et Hooker's Creek Australiæ subcentralis et ad flumen Victoriæ in locis petræis, *Hb. Muell.* No. 8, 81, et 83.

Calyx corolla aliquoties brevior. *A. impressæ* inter Juliferas affinis.

66. ACACIA IMPRESSA (*Ferd. Mueller*, non *Cunn.*). Breviter pubescens, ramulis angulatis, *stipulis semilanceolatis acuminatis diu persistentibus,* phyllodiis parvis ovatis v. ovato-lanceolatis apice obtusis cuspidato-apiculatis 3–5-nerviis anastomosanti-venosis juxta basin obscure glanduligeris, pedunculis axillaribus solitariis phyllodio paulo v. dimidio brevioribus (capitulis globosis v. subovatis), bracteolis lanceolatis longe acuminatis, calyce 5-partito ciliolato corolla 5-fida rigidula ter breviore. legumine fusco glutinoso pubescente oblongolineari compresso vix inter semina contracto et vix curvato intus continuo, *seminibus* ovatis *subfuscis utrinque insigniter impressis, strophiolo minuto* albido.

In rupibus ad flumen Victoria River, No. 82 ; Sturt's Creek, No. 8 ; inter Sturt's Creek et Victoria River, No. 83.

Frutex 8–12′. *Phyllodia* $\frac{2}{3}$–1″ longa, 3–6‴ lata. *Corolla* 1‴ longa. *Legumina* biuncialia circiter 4‴ lata. *Semina* vix 2‴ longa.

[Very closely allied to the broad-leaved varieties of *A. translucens*, Cunn., scarcely differing except in the down which covers the branches, phyllodia, and pods. Dr. Mueller refers it to the Juliferæ; but the capitula are globular in most of the specimens, only slightly ovoid in the specimens numbered 82, which are almost past flower; and the pod is quite different from that of the *A. Wickhami* and its allies among Juliferæ.—G. B.]

67. Acacia homalophylla, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 365. no. 148.

Murray, Darling et Murrumbidgee River, Avoca, St. Vincent's Gulf, Spencer's Gulf, Lake Torrens.

Frutex interdum arborescens. *Capitula* brevissime pedunculata. *Sepala* angusta basi cohærentia subpuberula corollam semiæquantia. *Legumina* tortuosa coriacea extus nigrescentia 4–5″ longa, semunciam lata, acuta inter semina leniter contracta.

68. Acacia pendula, *All. Cunn. in Don, Gen. Syst.* ii. p. 404.

Sturt's Creek Australiæ subcentralis.

Specimina sine flore et fructu reperta satis dubia.

69. Acacia stenophylla, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 366. no. 151.

Ad flumen Murray prope originem fluvii Sturt's Creek Australiæ boreali-occidentalis.

Arbor minor. *Legumina* pallida stipitata compressa lignoso-coriacea inter semina valde contracta, loculis vix ½″ latis. *Semina* longitudinalia subolivacea ovata leviter compressa 2½‴ longa utrinque areolato-impressa. *Strophiolum* minutum fulvidum, funiculo recto.

Speciminum tropicorum legumina nondum vidi, conveniunt autem cum aliis ab equite Mitchell in Australia orientali extratropica collectis.

70. ACACIA EXCELSA (*Benth. in Mitch. Austr. Subtrop.* p. 225.—Acacia pterocarpa, *Ferd. Mueller, MSS.*). Arborescens, ramulis angulatis, phyllodiis falcato-lanceolatis subopacis tenui-coriaceis acutis sessilibus plurinerviis imperfecte reticulato-venosis supra basin minute glanduligeris, pedunculis axillaribus solitariis monocephalis phyllodio pluries brevioribus, *leguminibus* stipitatis subcoriaceis compressis oblongo-linearibus angustissime alatis inter semina plus minusve contractis *indehiscentibus, seminibus estrophiolatis* ovatis leviter compressis nitidulo-nigris, areolis non impressis.

In virgultis Brigalow Scrub circum planities Peak Downs, No. 36.

Arbor minor. *Cortex* nigrescens rugosus frustulosus. *Phyllodia* viridia 1½–2″ longa, 3–5‴ lata. *Pedunculi* circiter semunciales. *Flores* ignoti. *Legumina* bipollicaria v. breviora, circiter 3‴ lata, non distincte venosa. *Semina* 2‴ vix metientia.

A. multinerviæ et *A. excelsæ* finitima.

[Dr. Mueller's specimens are in fruit, Col. Mitchell's in flower; but they appear to belong to the same species. The phyllodia are precisely the same, so is the inflorescence; for in Dr. Mueller's specimen the peduncles are not always solitary. Col. Mitchell notes that it is a large forest tree, Dr. Mueller found it a small tree; but that might depend upon locality.—G. B.]

71. ACACIA HEMIGNOSTA, n. sp. Glabra, ramulis tenuibus junioribus angulatis, *phyllodiis* tenuicoriaceis subglaucis lanceolato-oblongis obtusis leviter curvatis in basin longe angustatis subtrinerviis *creberrime venulosis* supra basin minute glanduligeris, pedunculis tenuibus axillaribus monocephalis solitariis phyllodio pluries brevioribus v. terminalibus racemum constituentibus, capitulis parvis multifloris, sepalis paulo puberulis perangustis liberis corolla parum brevioribus, leguminibus dilute fuscis chartaceis elongato-oblongis complanatis marginatis stipitatis indistincte venosis ad suturas flexuosis, *seminibus rotundis* leviter compressis *estrophiolatis* conspicue circulariter areolatis opacis squalide fuscis.

Ad flumen Albert sinus Carpentariæ, No 34. Ad fluvium Victoriæ, No. 87. Gilbert River, Roper River.

Frutex v. arbuscula. *Phyllodia* 1½–4″ longa. *Racemi* terminales inferne non raro foliati. *Capitula* vix pisi magnitudine. *Legumina* 3-pollicaria vel breviora, 3–5‴ lata. *Semina* vix 2″ metientia.

Huc probabiliter referenda est *Acacia* illa *hemignosta* ab illustri Bentham sub *Acacia melanoxylon* l. c. indicata olim ad sinum Cambridge

Gulf Australiæ boreali-occidentalis a beato Cunningham imperfecte collecta.

[Dr. Mueller is right in referring this to the plant gathered by A. Cunningham at Cambridge Gulf. It is very nearly allied to *M. melanoxylon*; but the flower-heads appear to be always solitary, on slender peduncles, and much smaller than in that species, and the pods more straight, broader, thinner, and shorter. The phyllodia are also usually more glaucous.—G. B.]

72. Acacia implexa, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 368. no. 156.

Prope urbem Bathurst, *C. Moore*. Ad ripas fluviorum a portu Phillip usque ad flumen Snowy River. Ad montem MacIvor. In tractu Bacchus Marsh.

Arbor minor. *Cortex* nigricans ramosissimus. *Sepala* cuneata ciliolata demum superne secedentia. *Semina* fusco-nigra nitentia oblongo-ovata leniter compressa circiter 2‴ longa exareolata. *Strophiolum* lividum implexum basin seminis tantum ambiens.

73. Acacia complanata, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 369. no. 160.

Wide Bay, *C. Moore*. Brisbane River, *Hill et Mueller*.

β. fasciculata, pedunculis numerosis fasciculatis raro racemosis, No. 32.

Frutex altior. *Sepala* cuneato-linearia puberula corollæ dimidium superantia. *Legumina* stipitata compressa tripollicaria v. breviora, circiter 3‴ lata, marginata, inter semina plus minusve contracta.

§ 10. *Juliferæ.*

74. Acacia tenuissima, n. sp. Glabra, ramulis gracilibus subangulatis, phyllodiis tenui-filiformibus leniter compressis muticis striolatis, spicis brevibus axillaribus solitariis densifloris glabris, calyce membranaceo obtuse dentato, corolla 5-loba calycem triente superante, leguminibus . . . .

Ad rivum Sturt's Creek Australiæ subcentralis, No. 72.

Phyllodia 2–4″ longa. *Pedunculi* floriferi semunciales vel breviores. *Spicæ* circiter 4‴ longæ, floribus minutis.

A. filifoliæ Benth. proxima.

[A good species. The striæ of the phyllodia are like those of *A. aciphylla*, Benth.; but the phyllodia are very much more slender, and not pungent. The spikes when in bud are like those of *A. xylocarpa*, the angular corollas projecting considerably above the calyx.—G. B.]

75. Acacia pityoides, n. sp. Glabra, ramulis teretiusculis, phyllodiis compresso-filiformibus oblique apiculatis subtiliter v. indistincte striatis, spicis brevibus densis cylindraceis axillaribus solitariis gemi-

nisve breviter pedunculatis, floribus parvis glabris, sepalis tenerrimis liberis oblongis corolla triente brevioribus, leguminibus linearibus flexuosis pallidis chartaceis inter semina leviter contractis aveniis.

In virgultis Brigalow Scrub, a fluvio Gilbert usque ad flumen Suttor, No. 6. Ad rivum Sturt's Creek, No. 5.

Phyllodia opaca $1\frac{1}{2}$–4″ longa, $\frac{1}{3}$–$\frac{2}{3}$‴ lata. *Spicæ* vix unciales. *Legumen* circiter sesquipollicem longum, 1–$1\frac{1}{2}$‴ latum. *Semina* desunt.

A. aneuræ et *ephedroidi* propinquæ.

[A specimen of this species is amongst Cunningham's specimens of his *A. xylocarpa*, which it closely resembles; but the phyllodia are not broader than thick, and the corollas appear more membranous, projecting less in the young spike. The foliage is precisely that of the following species (*A. orthocarpa*); but the pod, which I have not seen, is differently described by Dr. Mueller.—G. B.]

76. ACACIA ORTHOCARPA (*F. Muller, MS.*). Glabra, ramulis teretiusculis, phyllodiis filiformibus estriatis oblique et obtuse apiculatis, spicis axillaribus subgeminis pedunculatis, leguminibus lignescentibus lanceolato-linearibus rectis acutis margine obtusis longitudinaliter venosis intus oblique transversim septatis.

In plagis dumoso-rupestribus ad ortum fluvii M'Arthur River, No. 4.

Phyllodia longitudine inter $1\frac{1}{2}$ et 4″ varia, circiter $\frac{1}{2}$‴ crassa, sulcis duobus indistincte percursa. *Legumina* circiter bipollicaria 3–4‴ lata in basin sensim attenuata.

Species *A. gonocarpæ* propinqua.

[Closely allied to *A. xylocarpa* Cunn., and *A. pityoides* F. Muell. With the foliage of the latter, the fruit is precisely that of the *A. xylocarpa*.—G.B.]

77. ACACIA GONOCARPA, n. sp. Ramulis tenuibus compresso-angulatis junioribus ramulisque viscidis, phyllodiis angusto-linearibus elongatis uninerviis recurvo-apiculatis basi glanduligeris, spicis brevibus densis axillaribus geminis v. solitariis breviter pedunculatis glabris, sepalis linearibus liberis corolla 5-fida duplo brevioribus, *legumine sublignoso ad suturas rectas contracto oblique septato, valvis dorso convexis utroque latere acute carinatis.*

In terra Arnhem's Land juxta partem austro-occidentalem sinus Carpentariæ in plagis rupestribus, No. 7.

Frutex pluripedalis. *Phyllodia* pleraque 2–3″ longa, circiter $\frac{1}{2}$‴ lata. *Spicæ* unciales v. breviores. *Legumina* 2–3″ longa, fusca, ad suturas tantum $1\frac{1}{2}$‴ lata sed inter angulos dorsi 3‴ metientia, basi et apice sensim attenuata striolata. *Semina* desunt.

Species quam maxime singularis ad quintam Juliferarum sectionem pertinens, ad *A. xylocarpam* quoque approximans.

[Those specimens which are in flower only, precisely resemble the flatter-leaved specimens of *A. xylocarpa*, Cunn.; but the pod, from Dr. Mueller's description, must be quite different.—G. B.]

78. ACACIA DREPANOCARPA, n. sp. Erecta, glabra, ramulis superne angulatis, phyllodiis brevissime petiolatis elongato-linearibus subrectis basi et apice longe angustatis hinc apiculatis supra basin glanduligeris uni- trinerviis crebre parallelo-venosis, spicis axillaribus solitariis brevissime pedunculatis, *leguminibus lignescentibus complanatis* subfalcatis intus oblique septatis margine planis integerrimis apice obtusis basi longe acutatis.

In rupibus plagæ austro-occidentalis sinus Carpentariæ, No. 27.

Frutex. *Phyllodia* iis *A. juliferæ* et *delibratæ* simillima, sed glandula a basi paulo remota. *Rachis* cylindracea circiter sesquipollicaris. *Flores* desunt. *Legumina* iis *A. loxocarpæ*, *oncinocarpæ* et *aulacocarpæ* similia, 1½–3″ longa raro recta, margine (statu saltem immaturo) subcanaliculato-plana, extus oblique et fere parallelo-venosa.

A. loxocarpæ propinqua.

[Closely allied to *A. avida* Benth., and only appears to differ, as far as the specimens indicate, in the much narrower pods; but these are far from ripe in Dr. Mueller's specimen, and the only one on Cunningham's specimen is quite ripe and open.—G. B.]

79. ACACIA LYSIPHLOIA, n. sp. Subglabra, viscidula, ramulis angulatis, *phyllodiis* sessilibus (fere uncialibus) oblongis leviter curvatis cuspidatis 1–3-nerviis obscure parallelo-venosis *creberrime punctulatis* vix glanduligeris, *stipulis e lata basi lanceolato-subulatis diu persistentibus*, spicis brevibus axillaribus solitariis breviuscule pedunculatis densifloris cylindricis, sepalis angustis glabris corolla 5-partita triplo brevioribus.

Sturt's Creek, No. 84; Hooker's Creek, No. 86. In arenosis planitierum et vallium sinus Gulf of Carpentaria, e. g. ad ortum fluvii Limmen et Bight River, No. 3.

Arbuscula, coma planiuscula dilatata. *Cortex* exterior tenuis castaneofuscus in frustulis revolutis secedens. *Phyllodia* ¾–1″ longa, 1–1½‴ lata. *Spicæ* uncia sæpe breviores. *Legumina* ignota.

A. ptychophyllæ approximanda.

[Very near *A. linarioides*, Benth. The phyllodia are rather shorter and thicker and sometimes rather broader. The flowering spikes are closer and shorter, but they are younger; in the specimen No. 84, where they are more developed, they are nearly as long as in *A. linarioides*. If the pod (which is unknown) should not prove different, it must be considered as a mere shortened variety of *A. linarioides*.—G. B.]

80. Acacia linearis, *Sims, Bot. Mag.* t. 2156.

Satis frequens in vallibus silvaticis irriguis partis austro-orientalis coloniæ Victoriæ.

81. Acacia floribunda, *Willd. Sp. Pl.* iv. 1051.

Ad flumen Tamba terræ Gipp's Land.

Frutex 10–12′ altus.

82. Acacia mucronata, *Willd. Enum. Suppl.* p. 68.

In ericetis terræ Gipp's Land, prope flumen La Trobe River.

83. Acacia Sophoræ, *R. Br. in Hort. Kew.* ed. 3. p. 462.

Frequens ad litus arenosum coloniarum Victoriæ et South Australia.

β. *montana*, phyllodiis majoribus crassioribus distinctius venosis, ramulis spicisque viscidulis, legumine lato-lineari *compresso* (illo iconis Bill. non dissimili).

A. phlebophylla, *First Gen. Rep.* p. 12. In montibus altioribus graniticis (4000′ saltem elevatione) tractus Buffalo Range. Species forsan distincta.

84. ACACIA DALLACHIANA, n. sp. Arborescens, glabra, ramulis angulatis, phyllodiis falcato-lanceolatis breviter petiolatis opacis bi- vel trinerviis reticulato-venosis prope basin glanduligeris, spicis sessilibus axillaribus geminis cylindraceis densifloris, *corolla glabra quadrifida calycem ciliolatum triente superante*, germine glabro, leguminibus . . .

In montibus Buffalo Range.

Phyllodia illis *A. longifoliæ* persimilia utplurimum 3–4″ longa, 8–12‴ lata, in basin longius quam in apicem angustata. *Spicæ* 1–1½″ longæ odore inamœno, ante florum expansionem *bracteolis dense et pulchre squamatæ*. *Bracteolæ* peltatæ deltoideo- v. nephroideo-cordatæ obtusæ parce ciliolatæ vix ½‴ longæ. *Calyx* late campanulatus puberulus ad medium 4-fidus, lobis semiovatis, fere hyalinis. *Corolla* ochroleuca, laciniis deltoideis. *Stamina* sulphurea circiter 1½‴ longa, corollam triplo superantia.

[Of this I have seen no specimen.—G. B.]

85. ACACIA DELIBRATA (*All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 374. no. 177). Arborescens, ramulis angulatis glutinosis glabris v. velutinis, phyllodiis subsessilibus lineari-falcatis vel ensiformibus vel rarius abbreviatis angusto-oblongis oblique acuminatis v. cuspidato-apiculatis prominenter 1–3-nerviis glabris v. raro puberulis crebre parallelo-venosis ima basi glanduligeris, spicis brevibus axillaribus solitariis geminisve densis breviter pedunculatis, corolla 5-partita calycem dentatum ciliolatum semisuperante, *legumine* stipitato *chartaceo* angusto *oblongo compresso* marginato dilute fulvo margine undulato, seminibus lucenti-nigris compresso-ovatis strophiolo albido cymbiformi triplo longioribus utrinque insigniter impressis.

Arnhem's Land, No. 28. Head of Seven Emu River, No. 40. Upper Roper, No. 25. Moreton Bay, *Moore*. Fitzmaurice River, No. 91. Sturt's Creek, No. 92. Victoria River, No. 93.

Frutex 1–2-orgyalis. *Phyllodia* semipedalia v. breviora, raro tantum sesquipollicem longa, 1½–3‴ lata. *Spicæ* unciales v. breviores. *Legumina* 1–3″ longa circiter 4‴ lata, nitidula ad suturas non undulata. *Semina* sesquilineam longa. *Strophiolum* semel plicatum.

86. Acacia oligoneura (*Ferd. Mueller, MSS.*—Acacia delibrata, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 374, var.?). Glabra, ramulis gracilibus angulato-compressis, phyllodiis chartaceis subsessilibus elongatis angusto-lanceolatis acuminatis longe in apicem basinque angustatis leniter curvatis trinerviis reticulato-venosis basi glanduligeris, nervis juxta basin cum margine inferiore confluentibus, glandulis marginalibus nullis, spicis axillaribus solitariis vel fasciculatis brevibus cylindraceis glabris, pedunculis gracilibus, calyce laxo membranaceo dentato corolla ter breviore, leguminibus . . . .

In terra Arnhem's Land prope MacAdam's Range, No. 96; et Victoria River, No. 95.

Phyllodia pleraque 4–6″ longa, semunciam lata. *Spicæ* semunciales v. paulo longiores.

[The specimens Nos. 95 and 96 are in young seed, and Cunningham's are out of flower with a loose fruit; but as far as these materials admit of identification, they appear to belong to the same species: the phyllodia are, it is true, longer and not so coriaceous; but so they are in some of Cunningham's specimens. Dr. Mueller's specimen No. 91, from Fitzmaurice River, is exactly like one of Cunningham's, except with rather more coriaceous phyllodia; it is in good fruit, and the pod similar to Cunningham's. The specimens Nos. 71, 90 and 92 from Sturt's Creek, No. 25 from Roper, No. 40 from Seven Emu River, and No. 93 from Lower Victoria River, have still more coriaceous phyllodia, and, in the case of the two last, considerably shorter; but they probably all belong to one species.—G. B.]

87. Acacia torulosa, n. sp. (Acacia julifera, *F. Muell. MSS.*, non *Benth.*). Arborescens, ramulis superne angulatis, phyllodiis breviter et crasse petiolatis elongato- v. lineari-falcatis oblique glanduloso-apiculatis v. cuspidatis prominenter 3–5-nerviis crebre parallelo-venosis glabris ima basi glanduligeris, spicis brevibus axillaribus terminalibusque solitariis geminis ternisve densis breviter pedunculatis, calycis profunde partiti segmentis angusto-spathulatis ciliatis puberulis corolla triente brevioribus, *legumine* flexuoso *toruloso marginato* acuminato stipitato *inter semina valde contracto.*

Sandy banks of the Nicholson, No. 26. Roper River, No. 23. Gulf of Carpentaria, No. 24.

Frutex elatior. *Phyllodia* et *spicæ* illis *A. delibratæ* similia. *Legumina* 2–4″ longa, matura non visa.

[This appears to me to be a good species; the pod is different from any one I am acquainted with in this section. It is not my *A. julifera*, which may perhaps be one of the numerous forms of *A. delibrata.* —G. B.]

88. Acacia doratoxylon (*A. Cunn. in Field, N. S. Wales*, p. 345? —Acacia pachycarpa, n. sp., *F. Muell, MSS.*). Glabra, ramulis superne angulatis, phyllodiis brevissime petiolatis lanceolato- v. elon-

gato-linearibus plus minus falcatis recurvo-apiculatis subtrinerviis crebre et tenuissime parallelo-venosis, basi glanduligeris, spicis brevibus axillaribus terminalibusque solitariis geminisve densis breviuscule pedunculatis, *calyce 5-sinuato glabro corolla ter breviore, legumine pallide fusco crasso* elongato-oblongo flexuoso *indehiscente* toruloso marginato apice obtuso basi acuto *ad suturas fere recto, seminibus ovato-globosis opacis atris* subcompressis minutim albido-strophiolatis.

Ad rivum Sturt's Creek Australiæ subcentralis, No. 89.

Arbor, nisi fallor, elata. *Phyllodia* bipollicaria v. fere pedalia, circiter 3''' lata. *Corollæ* parvæ. *Legumina* 1½–2½'' longa, vix semunciam lata. *Semina* circiter 2''' longa, altero latere sæpius valde convexa, altero magis applanata.

Species phyllodiis *Acaciæ drepanocarpæ, juliferæ et delibratæ* similis, legumine autem ample diversa.

[I can see nothing in the phyllodia and flower to distinguish this from the *A. doratoxylon*, A. Cunn., of which the fruit is unknown.—G. B.]

89. Acacia Leucadendron, *All. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 374. no. 178.

In montibus Newcastle Range Australiæ orientalis tropicæ, No. 29.

90. ACACIA CONSPERSA, n. sp. Elatior, erecta, ramis teretibus rachibusque pubescentibus, phyllodiis sessilibus coriaceis parce pulverulentis angusto-lanceolatis tenuicuspidato-apiculatis uninerviis creberrime parallelo-venosis supra basin glanduligeris, spicis axillaribus subsessilibus, *leguminibus teretiusculis* leviter compressis coriaceis vix venosis intus continuis breviter stipitatis non marginatis, seminibus ovato-oblongis compressis nitenti-nigris strophiolo plicato albido aliquoties longioribus lateraliter conspicue areolatis.

In plaga arenoso-petræa prope ortum fluvii Roper et Limmen Bight River, No. 30.

Frutex 5–10'. *Phyllodia* 1½–3'' longa, 3–4''' lata, furfure deciduo subtili conspersa. *Rachis* fructifera uncialis v. paulo longior. *Legumina* 2–4'' longa, sesquilineam lata dilute fusca extus canescentia. *Semina* sesquilinearia areolis oblongo-linearibus notata.

A. leptocarpæ proxima.

[Differs from *A. leptocarpa* in the pubescent stems, the phyllodia shorter, rather narrow, straighter, and more coriaceous, terminated sometimes by an almost pungent point, although occasionally obtuse or with a terminal gland. The pod is also thicker. It will require more complete specimens to determine how far these differences are specific. —G. B.]

91. Acacia Cunninghami, *Hook. Icon. Plant.* ii. p. 165. no. 180.

Moreton Bay, *Ferd. Mueller*. Clarence et Richmond River, *C. Moore.*

92. ACACIA GONOCLADA, n. sp. Erecta, ramulis robustis pruinosis compresso-triquetris, phyllodiis glabris subglaucis brevissime petiolatis

lanceolato-oblongis leviter curvatis apice obtusis *callo glanduligero terminatis* basi distincte glanduligeris bi- v. trinerviis parallelo-multivenosis, spicis axillaribus solitariis geminisve brevibus cylindraceis breviter pedunculatis, calycibus quinquedentatis rachibusque velutinis, *petalis enerviis* glabris calycem semisuperantibus demum liberis obtusiusculis, leguminibus compressis marginatis. . . . . .

Ad partes superiores fluvii Victoriæ et in terra Arnhem's Land in rupibus, No. 9.

Frutex paucipedalis strictus. *Phyllodia* 2½–4″ longa, 4–6‴ lata, tenuicoriacea. *Spicæ* ½–1″ longæ. *Calyces* semilineam paulo excedentes. *Legumina* matura deficiunt.

Species *A. calyculatæ* et *A. acradeniæ* (*A. umbellatæ*, Cunn.) proxima.

[Allied to *A. Cunninghamii,* and has the same remarkably angular branches; but the phyllodia are much shorter and straighter, and the young pods are different, although it evidently belongs to the same group.—G. B.]

93. Acacia amentifera, n. sp. Glabra, ramulis angustatis, *phyllodiis* parvis *fasciculatis* angusto-oblongis obliquis basi angustatis sessilibus apice recurvis brevissime rostellatis (enerviis v.) obscure 1–3-nerviis, glandula marginali venisque nullis, spicis densis axillaribus oblongo-cylindraceis solitariis sessilibus glabris, bracteolis lineari-subulatis stipitatis, petalis lanceolatis solutis *sepala lineari-filiformia libera* triente superantibus, leguminibus . . . . . .

Upper Victoria, No. 74.

Phyllodia 3–5‴ longa, ¾–1½‴ lata, exsiccatione rugulosa. *Spicæ* floriferæ 3–4‴ longæ. *Flores* 1‴ breviores. *Legumina* desunt.

Species distinctissima, *A. Wickhami* consocianda.

[A very distinct species. The phyllodia are small and fasciculate, as in *A. subternata* among *Brunioideæ,* shaped more like some of the narrow-leaved forms of *A. arcuata,* but much smaller, whilst the flowers show an affinity to *A. Wickhami.*—G. B.]

94. Acacia Wickhami, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 377. no. 187.

Inter flumina Victoria River et Sturt's Creek, No. 85.

β. *viscidula,* ramulis innovationibusque subviscosis, phyllodiis late et oblique ovatis prominenter plurinerviis. Sturt's Creek.

Calyx glaber leniter sinuatus. *Legumina* non visa, et species igitur incerta.

95. Acacia Wickhami, specimen fructiferum? (Acacia calligera, *Muell. MS.*). Glabra, glaucescens, ramulis angulatis, phyllodiis parvis sessilibus oblique ovatis undulatis *callo glanduligero terminatis uninerviis* obscure venosis, spicis densis axillaribus solitariis breviter pedunculatis, legumine viscidulo duro plano oblique striato angusto-lanceolato ad marginem recto obtuso oblique septato.

Gulf of Carpentaria, No. 38.

Phyllodia tenuicoriacea 2–4‴ longa. *Rachis* fructifera fere 1″ longa. *Legumina* bipollicaria v. breviora. *Flores* et *semina* desunt.

[I can see nothing to distinguish this from *A. Wickhami*, except that the specimens are in fruit, all those hitherto described of *A. Wickhami* being in flower only.—G. B.]

96. ACACIA PTYCHOPHYLLA, n. sp. Subglabra, viscidula, ramulis angulatis, phyllodiis coriaceis subsessilibus (fere uncialibus) oblongis obtusis vix curvatis subglanduloso-apiculatis prominenter paralleloque plurinerviis prope v. infra medium obscure glanduligeris, spicis axillaribus solitariis densis cylindraceis breviuscule pedunculatis, calyce 5-partito petalis duplo breviore laciniis obtusis.....

Sturt's Creek, No. 3 et 80.

Phyllodia $\frac{3}{4}$–$1\frac{1}{2}$″ longa, 2–$2\frac{1}{2}$‴ lata striata. *Spicæ* floriferæ circiter unciales, pedunculo semunciali. *Legumina* incognita.

A. stigmatophyllæ congrua.

[Differs from *A. stigmatophylla* in its rather shorter thick coriaceous phyllodia, in the viscidity of the young shoots, and the thicker, denser spikes, with larger flowers.—G. B.]

97. ACACIA UMBELLATA (*A. Cunn., Benth. in Hook. Lond. Journ. of Bot.* i. p. 378.—Acacia acradenia, *F. Muell. MSS.*). Elatior, erecta, ramis superne compresso-angulatis, phyllodiis breviter petiolatis coriaceis oblique oblongo- v. ovato-lanceolatis marginatis *callo glanduligero terminatis* plurinerviis parallelo-multivenosis basi indistincte glanduligeris ramisque glabris, nervis prope basin marginis inferi confluentibus, spicis axillaribus et terminalibus solitariis geminis ternisve cylindraceis brevissime pedunculatis phyllodio brevioribus, bracteolis spathulatis unguiculatis, calycibus ad trientem 5-fidis rachibusque velutino-puberulis, corollæ 5-fidæ calycem semisuperantis laciniis acutis carinulatis rigidulis, leguminibus coriaceis teretiusculis leviter curvatis obtusis continuis, seminibus lucenti-nigris ovatis compressis strophiolo fulvido triplo breviore præditis.

Ad sinum Gulf of Carpentaria, No. 10. Seven Emu River. Ad originem fluminis Victoriæ in plagis sterilioribus, No. 6.

Rami juniores et innovationes sæpe visciduli. *Phyllodia* 2–3″ longa, $\frac{2}{3}$–1″ lata. *Spicæ* $1\frac{1}{2}$–2″ metientes. *Raches* glabrescentes. *Calyces* $\frac{1}{2}$‴ longi. *Legumina* circiter $1\frac{1}{2}$‴ longa, totidem lineas lata. *Semina* sesquilineam metientia.

Species Acacias juliferas et dimidiatas conjungens inter illas *A. stigmatophyllæ* proxima, inter dimidiatas venis numerosissimis parallelis nec anastomosantibus distinguenda.

[Cunningham's specimen is very bad, which accounts for the imperfect description which prevented Dr. Mueller from recognizing it. The name is also inappropriate, unless it referred to the character of the tree from which it was gathered.—G. B.]

98. ACACIA AULACOCARPA (*A. Cunn., Benth. in Hook. Lond. Journ. of Bot.* i. p. 379.—Acacia leptophleba, n. sp., *F. Mueller, MSS.*). Subglabra, ramulis compresso-angulosis, phyllodiis coriaceis oblongis subfalcatis brevissime petiolatis basi glanduligeris apice obtusis et glanduloso-apiculatis tenuiter trinerviis subtilissime crebroque longitudinaliter venosis, spicis axillaribus pedunculatis solitariis longiuscule cylindraceis, sepalis subliberis oblongis laxis membraneis corolla 5-fida dimidio brevioribus, leguminibus ......

Ad rivum Sturt's Creek, No. 97.

Phyllodia 1½–2½″ longa, 5–8‴ lata (in unico suppetente specimine). *Spicæ* circiter sesquiunciales. *Corollæ* vix 1‴ longæ. Species *A. gonocladæ* proxima.

[The specimens are small and in flower only; but they do not appear to me to be in any point distinguishable from the *A. aulacocarpa.*—G. B.]

99. Acacia aulacocarpa, *All. Cunn.*

β. brevifolia (F. Muell. MSS.), phyllodiis oblique ovatis 1–1½″ longis.

Suttor Desert, No. 39.

Legumen fuscum pollicare in stipitem semuncialem sensim contractum.

[Probably a distinct species: the pod is broader, narrowed into a much longer stipes than in Cunningham's specimens, which, however, are not ripe. The phyllodia are very much shorter.—G. B.]

100. Acacia crassocarpa, *A. Cunn. ex Benth. in Hook. Lond. Journ. of Bot.* i. p. 379. no. 194.

Point Pearce, No. 94. Victoria River, No. 95.

Paulo recedit a descriptione phyllodiis duplo minoribus. *Legumina* dilute fusca tantum ima basi angustata prominenter venosa, venis transversis plus minusve anastomosantibus. *Semina* obliquo-transverse sita, 2‴ longa *oblonga* nitentia olivaceo-nigrescentia, strophiolo vix 1‴ metiente livido prædita.

101. ACACIA MEGALANTHA, n. sp. Glabra, ramulis teretiusculis superne compressis, phyllodiis coriaceis brevissime petiolatis dimidiato-ovatis v. falcato-oblongis obtusiusculis prominenter bi- v. trinerviis crebre parallelo-venosis basi glanduligeris, spicis axillaribus solitariis pedunculatis, floribus magnis remotiusculis glabris subglutinosis, calyce arcto acute 5-dentato petalis crassis triplo breviore, legumine ......

In deserto Australiæ subcentralis ad rivum Sturt's Creek, No. 98.

Phyllodia 1½–3″ longa, ⅔–1″ lata. *Spicæ* circiter unciales læte luteæ. *Corollæ* sesquilineares.

Haud prætermittere volui speciem ut videtur raram *A. acradeniæ* propinquam, etiamsi e frustulis fructu destitutis pessime circumscribendam.

[Very distinct in the unusually large size of the individual flowers.—G. B.]

102. Acacia retinervis (*Benth. in Lond. Journ. Bot.* i. p. 379.—Acacia tumida, *F. Muell. MSS.*). Arborescens, glabra, ramulis teretiusculis, phyllodiis breviter petiolatis oblongo-falcatis basi acutis prominenter plurinerviis creberrime parallelo-venosis glaucescentibus glanduloso-apiculatis, glandula basali parva v. indistincta, spicis axillaribus solitariis geminis ternisve raro subpaniculatis tenuiter cylindraceis phyllodio multo brevioribus, pedunculo perbrevi pubescente, calyce profunde partito velutino corolla dimidio breviore, leguminibus subcylindraceis torulosis coriaceis arcuatis v. leniter curvatis fuscescentibus intus subcontinuis, seminibus nigrescentibus lucentibus ovatis leniter compressis utrinque conspicue areolatis strophiolo fulvido plicato pluries longioribus.

In locis rupestribus ad flumen Victoriæ, ad promontorium Point Pearce, No. 100. Ad rivum Sturt's Creek, No. 99.

Phyllodia 3–5'' longa, 8–12''' lata. *Spicæ* circiter unciales læte luteæ. *Flores* parvi. *Legumina* breviter stipitata, 1½–2½'' longa, circiter 3''' lata, intus septis membranaceis imperfectis oblique percursa. *Semina* circiter 2''' longa, areola fuscescente.

A. Cunninghami et quoad legumina *A. acradeniæ* affinis.

[The anastomosing of the smaller veins can scarcely be seen without the help of a glass; and it is not so frequent in the broad-leaved as in the narrow-leaved specimens.—G. B.]

103. Acacia stipuligera, n. sp. Pubescens, ramulis teretibus, phyllodiis breviusculis oblique lanceolatis leviter curvatis sessilibus cuspidato-apiculatis prominenter bi- v. trinerviis creberrime anastomosanti-venosis supra basin glanduligeris, *stipulis scariosis deltoideis persistentibus,* spicis axillaribus geminis breviter pedunculatis dense cylindraceis, bracteolis lanceolatis unguiculatis acuminatis. . . . . .

Sandstone table-land with scrub at the head of the Victoria River, of Hooker's Creek, and Sturt's Creek.

Frutex 5–8'. *Phyllodia* 1–1½'' longa, 3–8''' lata, tenuiter venosa. *Stipulæ* fuscæ circiter 1''' metientes. *Pedunculi* albo-velutini. Nec flores evolutos nec fructus vidi.

Species probabiliter cum *A. retinervi* concatenata.

[Appears to be a distinct species; but the specimen is very imperfect.—G. B.]

§ 11. *Dimidiatæ.*

104. Acacia latescens, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 380.

γ. *grandifolia* (var. *dubia*) glabra phyllodiis chartaceis majoribus.

In collibus inter flumina Dawson et Burnett, No. 35.

Sepala cohærentia cuneato-linearia corollæ dimidium æquantia.

[The phyllodia are rather broader than in Cunningham's specimens, with more nerves; but they do not otherwise differ.—G. B.]

105. Acacia platycarpa, n. sp. Glaberrima, ramulis gracilibus flexuosis apice angulatis subpruinosis, phyllodiis glaucescentibus lanceolato-falcatis dimidiatis chartaceis in petiolum brevem angustatis apice obtusis bi- v. trinerviis crebre reticulato-venosis, nervis basin versus cum margine infero confluentibus, glandulis marginalibus duabus vel tribus, capitulis axillaribus solitariis longiuscule pedunculatis, leguminibus oblongis complanatis glaucis anguste alatis obtusis dense reticulato-venosis inter semina non contractis.

Ad sinum Gulf of Carpentaria, No. 8. Ad flumen Victoriæ.

Frutex arborescens. *Phyllodia* 3–4″ longa, ½–1″ lata. *Pedunculi* circiter pollicares. *Legumina* 2½–4″ longa, circiter 1″ lata, prorsus matura ut flores ignota.

[The phyllodia are precisely those of the *A. sericata*, Cunn.; but the minute glaucous down is wanting, and the pods are thinner than the one I described, which I have not now before me to compare.—G. B.]

106. Acacia holosericea, *All. Cunn. in G. Don, Gen. Syst.* ii. p. 407, no. 201.

Ad flumen Victoriæ alibique in terra Arnhemica, No. 79.

β. *pubescens* spicis interdum geminis. In rupibus secus flumen Victoriæ. Ad flumen Roper.

Legumina coriacea cincinnata, extus dense pubescentia, intus continua glabra, inter semina vix contracta. *Semina* nigrescentia sesquilineam longa compressa ovata.

107. Acacia limbata, n. sp. Glaberrima, ramulis acutangulis glaucis, phyllodiis sessilibus subfalcato-oblongis breviter uncinato-cuspidatis subtrinerviis supra basin crebre reticulato-venosis glandula minuta præditis, nervis basin versus cum margine infero confluentibus, spicis axillaribus solitariis longiuscule pedunculatis, leguminibus duris complanatis angusto-lanceolatis margine crasso cinctis inter semina non contractis pleiospermis venulosis basi sensim angustatis.

In Australia boreali.

Phyllodia 1½–2½″ longa, circiter ½″ lata. *Venæ* primariæ nervis parallelæ. *Pedunculi* fructiferi recti unciales v. paulo longiores. *Legumen* 1½-2″ longum oblique subparallelo-venosum. *Semina* matura deficientia.

[I have not seen the specimens of this plant.—G. B.]

108. Acacia dimidiata, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 381. no. 202.

North Australia, No. 11. M'Adam Range, No. 78. Victoria River.

Legumina usque ad 5″ longa, vix 3‴ lata. *Semina* subtetragono-ovata lucenti-nigra fere 3‴ longa, strophiolo squalide fulvo fere triplo breviore cupulata.

β. *eriostachya*, petalis calycibusque tomentosis.

Victoria River, No. 77.

Variat quoque phyllodiis duplo minoribus subvelutinis, leguminibus viscidulis cano-velutinis.

[The variety β connects the *A. humifusa,* Cunn., with this species as a mere variety.—G. B.]

109. Acacia latifolia, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 382, no. 204.

In plagis elevatis petræis prope originem fluvii Limmen Bight River terræ Arnhemicæ et ad sinum Carpentariæ.

Frutex pauci- pluripedalis. *Legumina* compressa lato-linearia leviter curvata v. arcuata glabra marginata imperfecte venosa inter semina vix aut leniter contracta pleiosperma 1½–2½″ longa, circiter 2½‴ lata. *Semina* matura ignota.

Variat phyllodiis conspicue minoribus.

Series II. *Botrycephalæ.*

110. Acacia polybotrya, *Benth. in Hook. Lond. Journ. of Bot.* i. p. 384, no. 209.

Burnett River.

Variat paribus foliolorum usque ad xxv.

111. Acacia decurrens, *Willd.*

Ad flumen Snowy River.

Series III. *Pulchellæ.*

112. Acacia Mitchelli, *Benth.*

Glenelg River. Portland Bay.

113. **Acacia basaltica**, n. sp. Fruticosa, inermis, ramulis teretiusculis petiolis pedunculisque fusco-subvelutinis v. puberulis, stipulis imperfectis, pinnis 1–3-jugis, glandulis jugalibus minutis rotundis sessilibus, petiolari nullo, foliolis 5–10-jugis oblongo-ovatis puberulis obtusis muticis uninerviis subtus pallidioribus, pedunculis axillaribus solitariis monocephalis folio brevioribus v. subæquilongis, capitulo globoso, calyce breviter dentato corollaque parce puberulis, hac illum dimidio excedente ad trientem divisa, legumine angusto-oblongo venoso breviter stipitato compresso puberulo margine parum flexuoso.

In virgultis planitierum basalticarum Peak Downs, No. 42.

Epidermis ramorum membranacea secedens. *Foliola* 1½–3‴ longa. *Pedunculi* crassiusculi subangulati, sæpius supra medium bractea minuta præditi. *Legumen* fuscum circiter 3″ longum, ½″ latum venosum. *Semina* matura desunt.

[A very distinct species, which may be placed next to *A. nigricans* and *A. Mitchelli.*—G. B.]

Series IV. *Gummiferæ.*

114. ACACIA LENTICELLATA (*F. Muell. MS.*—Acacia Farnesiana, *Willd., Benth. in Hook. Lond. Journ. of Bot.* i. p. 494). Fruticosa, ramulis flexuosis glabris crebre lenticulatis vix angulatis, spinis tenuibus rectis, pinnis 1–3-jugis, petiolis rachibus foliolisque ciliolatis, glandula scutellari paris inferi manifesta, paris superi minima v. nulla, rachi decidue mucronata, foliolis 8–16-jugis oblongis v. oblongolinearibus uninerviis, pedunculis axillaribus solitariis velutinis folio brevioribus apice bracteatis, capitulo globoso, corolla glabra ad quadrantem divisa calycem ciliolatum semisuperante, legumine oblique oblongo-cylindrico turgido spadiceo loculato glabro indehiscente, seminibus horizontalibus ovatis fuscis opacis.

Ad ripas, circum lacunas et in locis tempore pluviali inundatis Australiæ borealis centralis et intratropico-orientalis.

A. Farnesiana, *Leich. Overland Exped.*; *Benth. in Mitch. Trop. Austr.* p. 256; *Ferd. Mueller collect.*; an *Willd.*?

Frutex amplus elatior. *Foliola* pleraque 1½–2½''' longa. *Legumen* 1½–2½'' longum. *Semina* fere 3''' metientia.

[The fewer pinnæ and pubescent peduncles in the Australian specimens induced me formerly to doubt whether they really belonged to the *A. Farnesiana,* especially as I had not then seen the fruit, and the specimens generally were bad. But I have since seen both East Indian and South American specimens agreeing precisely with the Australian form, and passing gradually into the commoner Tropical varieties.—G. B.]

115. ACACIA PALLIDA (*F. Muell.*, non *Willd.* quæ *Prosopis* species). Arborea, glabra, ramulis parum angulatis, spinis crassis curvato-divergentibus interdum abolescentibus, pinnis pauci- novem-jugis, glandula scutellari inter paria infimum et supremum ovata, foliolis 8–22-jugis oblongis obtusis glaucis venulosis uninerviis, pedunculis axillaribus solitariis monocephalis folio brevioribus angulatis medio bracteatis, capitulo globoso glabro, corolla ad quadrantem divisa calycem argute dentatum fere triplo excedente, legumine angusto-oblongo basi attenuato satis compresso recto lævi enervi, seminibus verticalibus dilute fuscis quadrato-ovatis.

In locis minus fertilibus præsertim campis apricis Australiæ intratropicæ non rara, No. 76.

Arbor minor, cortice suberoso sordide cano rugoso et rimoso. *Spinæ* 2-3''' longæ basi valde incrassatæ. *Foliola* 1½–3''' longa, ½–1½''' lata. *Capitula* majuscula. *Legumina* 2–4'' longa, circiter ½'' lata. *Semina* 3–4''' longa nitoris expertia.

A. suberosæ propinqua.

[The specimens marked 76, from Victoria River, are nearly allied to *A. Bidwelli*, but differ in the longer leaflets, the shorter pods, and

some other points. The proper place of *A. Bidwelli* is probably also among *Gummiferæ*. I had only seen it in fruit, when the real inflorescence is not always very certain; and I doubted whether the capitula were not sometimes racemose: but most probably they are (as in *A. pallida*) solitary, with the bract in the middle of the peduncle, the scar of which has sometimes the appearance of the scar of of a pedicel. Dr. Mueller's specimens, No. 76, are also without spines, and have much more numerous pinnæ than he describes (15 to 20 pairs with leaflets barely 2 lines long). These are, like Bidwell's, in fruit only. There is, however, a flowering specimen of Dr. Mueller's marked 75, from M'Adam's Range, which answers better to his character, and has the stipular spines of *Gummiferæ*. In it the pinnæ vary from 3 to 11 pairs, and the leaflets are 3 to 4 lines long. These clearly indicate the affinity of the species with *A. suberosa*, from which it differs in the usually numerous pinnæ and the broader pod. It remains to be proved whether it be specifically distinct from *A. Bidwelli*, which has the leaflets seldom 1 line long, and the pod, although unripe, already above 4 inches, and marked with veins, which may possibly disappear when the pod is ripe. —G. B.]

Contributions to Organographic Botany. By CHRISTOPHER DRESSER, Esq. Communicated by the Secretary.

[Read April 1st, 1858.]

[Abstract.]

MR. DRESSER passes successively under review the scales of the leaf-buds, the bracts, the sepals, the petals, the stamens, and the carpels of plants, with the view of showing that they are not, as usually considered, metamorphosed leaves, but metamorphosed leaf-stalks or petioles.

In support of this view, in relation to the development of leaf-buds, he enters into a detail of the structure of the Horse-chestnut, the Sycamore, the Walnut, the Cherry, the Currant, &c., but admits that in some instances, the Holly for example, the scales are more obviously analogous to the lamina of the leaf. With regard to bracts he instances *Angelica officinalis* and *Salvia fulgens*, in the latter of which he particularly calls attention to certain monster bracts and their venations, as affording clear evidence of their petiolar origin. The cases adduced in proof of a similar origin in the calycine leaves are, first, the abnormal development of one of the sepals in *Mussænda*; secondly, the frequent greater or less development of foliola upon the margins of the sepal in roses, which sepal consequently is to be regarded as equivalent to the common petiole of the ordinary leaves of the plant; thirdly, the monstrous calyces of the Primrose, figured in Dr. Lindley's 'Elements of Botany' (figs. 147 and 148), in which laminæ corresponding with those of the leaves are seen to be developed on the apices of the united sepals; and lastly, the analogy of the ascidia of the Pitcher-plant, which are acknowledged to be petioles and not laminæ, with the calyx of the Lavender, in which one of the sepals developes a lamina or lid, which is slightly articulated with the tube of the gamosepalous calyx. In relation to sepals, however, Mr. Dresser thinks it highly improbable that those plants which have sessile leaves should produce petiolar calyces, but believes that the sepals may in these instances be derived either from the true lamina, or from a modification of its midrib. He applies the same reasoning to the origin of the petals; but although admitting the petals to be in some instances representatives of the laminæ of the leaves, he thinks it contrary to reason to suppose that this is really their mode of formation in some of those instances in which the petiole and the lamina of the leaf are thought to be most conspicuously manifested in the unguis and limbus of the petal. Thus, for instance, in the Sweet William and the common Pink, in which these two subdivisions of the petal are most distinct, the ordinary leaves are all sessile. His conclusion is, that therefore "on those plants which have sessile leaves we may look for petals formed of the lamina of the leaf or of its midrib, and on those with petiolar leaves for those formed of the petiole."

With regard to stamens, in which the filament is usually regarded as representing the unguis of the petal and the petiole of the leaf, and the anther as analogous to the limb of the petal and the lamina of the leaf, he thinks there exists no good ground for such a supposition. In the transformation of the stamen of the Rose there is no trace to be found of such a distinct origin of its parts; the stamen of the Poppy, in passing into the petaloid condition, is wholly transformed into an exunguiculate petal; and in *Tradescantia Virginica* the anther is evidently a modification of a portion of a petal only, while another portion is transformed into the filament. It is evident therefore, Mr. Dresser thinks, that where petals are petiolar bodies, the entire stamen owes its origin to the petiole alone. So also in relation to carpels, he entirely dissents from the opinion that they are derived from the laminæ of the leaves and that the ovules bear the same relation to them as the buds on the margins of the leaves of *Bryophyllum* to the leaves of that plant. The monster carpels of the Columbine, figured in Dr. Lindley's 'Elements' (fig. 180), he regards as offering a clear indication in their venation of their petiolar origin, and their ovules metamorphosed into leaflets as bearing the same relation to the carpels as the leaflets of a compound leaf to the common petiole from which they arise. This view of the relation of ovules to carpels leads him to propose the following theory of their origin; viz. "that ovules are a metamorphosed state of the leaflets of compound leaves, or of the lobes or parts of simple leaves;" and he concludes his Paper by some observations in which this theory is developed more at length.

Letters on the Vegetation of West Equinoctial Africa. From Dr. Frederick Welwitsch, addressed to W. W. Saunders, Esq., V.P.L.S.

[Read July 1st, 1858.]

S. Paulo de Loanda,
12 Sept., 1857.

My highly esteemed friend,—A few days since, I returned from the interior suffering from fever, which for five weeks has daily attacked me. I cannot, however, refrain from sending you a hasty sketch of the extent and success of my botanical rambles in the interior of this wonderful country, with best wishes that these lines may find you and my other London friends in good health.

During the first year of my residence in this country, I endeavoured to investigate the botanical treasures of the coast territory from the Quizembo River north of Ambriz as far as the mouth of the Coanza, which I very nearly succeeded in doing. In October 1854 I ascended by degrees over the lower mountains, which were mostly covered only with *frutices*, to the dark shady region of the mountain forests of Cazenojo and Golungo Alto, where I stayed nearly two years. Everything that reminds you of the flora of the coast and of the lower mountains disappears suddenly as if by magic in this region, whose highest mountain-peaks rise more than 2000 feet. Above 300 different species of trees and more than 400 kinds of climbing plants, closely entwined, form here a most magnificent primeval forest, whose ground is luxuriantly overgrown by more than sixty species of ferns, partly of arborescent forms. Amongst other most remarkable trees I found a *Napoleona* (ramis verticillatis), a *Myristacacea* (a noble tree 80 to 100 feet high), twenty-eight species of *Ficus*, some gigantic specimens of a *Na-*

thusia (foliis simplicibus), and also a multitude of species, almost all large trees, of the families *Hypericaceæ*, *Rubiaceæ*, *Bignoniaceæ*, *Verbenaceæ*, *Leguminosæ*, *Mimoseæ*, &c. But what particularly delighted me was the discovery of *Monodora Myristica*, already supposed to be native here by R. Brown, which is a native of all the primeval forests of these districts, and which represents one of the most gigantic and certainly one of the most splendid forest trees of the whole of tropical Africa. Later I found at Pungo Andongo, a second species, specifically different in the leaves and fruit, which I have named *Monodora Angolensis*. I will send many fresh seeds of both to England.

Terrestrial and parasitical Orchids are pretty tolerably abundant. Among the former there is one remarkable species, probably of the genus *Lissochilus*, distinguished by broad leaves nearly 5 feet long; a flower-stem 10 feet to 12 feet high; and particularly by a spike of blossoms often 1½-foot long, bearing twenty to twenty-five large rose-coloured flowers. This is probably the largest and most magnificent of all terrestrial Orchids hitherto discovered. Of this species I have roots ready to be sent to London at the first direct opportunity which offers. To show the gigantic dimensions of this species, I shall send you the dried flower-stem. Generally speaking, the whole vegetation of Golungo Alto has a truly gigantic character, so that there is no room left for the growth of smaller plants, especially annuals, with the exception of some *Gramineæ* and *Cyperaceæ*. An Umbellifer, whose leaves at the same time form one of the most famous remedies of the negroes, occurs in the form of a large tree of 1 foot to 1½ foot in diameter, used as timber; likewise, among the numerous and in most instances woody *Compositæ*, there occur two species as strong lofty trees. Almost all the *Artocarpeæ* which are found here will form quite new and very remarkable genera, but at the same time will show in the clearest light the transition of this family into the *Moreæ* on one side, and the *Urticeæ* on the other. A genus nearly allied to *Dorstenia* grows as a large woody shrub 4 feet high, in general habit like a Fig; but the receptacles are obconic, truncate, and open, just as in *Kosaria*. Also among the *Sapindaceæ* and *Combretaceæ*, and especially among the *Leguminosæ*, many highly interesting new genera are to be found.

The most interesting fact in Phytogeography will be that I have found here a *Begonia*, a *Hypoxis*, an *Ottelia*, a *Gnetacea*, a *Balsaminea*, and two *Cedreleæ*—all families of plants which have not before been met with in tropical Africa. A still more interesting fact in geographical botany, which has come to my notice, is that a pendent parasitical *Rhipsalis*, often 6 feet to 8 feet long, occurs here, growing abundantly in the elevated woods of this country, particularly luxuriating on *Adansonia* and *Sterculia*, which consequently proves that *Cacti* are not restricted to America, as has hitherto been asserted. I will send living specimens also of this *Rhipsalis*, which I call *Rh. Æthiopica*, to you and Sir William Hooker.

In the whole, I believe I have collected in this wood-region 2000 species of plants, of which I have tried to describe the most remarkable genera, chiefly from living specimens. Farewell.

Dr. Friedrich Welwitsch.

A *Polygalea* occurs as a climber 20 feet to 50 feet high, ⅔ foot in diameter. I believe it to be a *Lophostylis*, Hochst.

S. Paulo de Loanda, 10th Feb. 1858.

Highly esteemed Sir and Friend,—When I was about to communicate to you last September a preliminary report on some of the results of my journey in the interior of Equinoctial Africa, I was prevented by a long illness from completing my letter, but send it now with these lines, as it contains something important about the vegetation of Golungo Alto and the adjacent mountain district. As I now feel rather better, I take the liberty of continuing today the letter I had then commenced. In the first place, I beg to remark that I have penetrated, in a direct line, about 250 geographical miles into the interior; and I divide the territories I have visited into three regions:—1. Littoral and lower mountain region; 2. Region of the primeval dense forest woods (*Regio montoso-sylvatica*); and, lastly, 3. The flat woody region (*Regio plano-sylvatica*). The first region rises to about 1000 feet, the second to about 2500, the third about 3300 feet. I have taken the measurement of the heights of these regions, but have not yet made an exact computation of the results, and therefore note the heights as given above only as temporary. These three regions extend from west to east in such a way that the first stretches towards the east as far as 80 geographical miles, the second to about 160, and the third to somewhere about 250. Regarding the vegetation of the littoral region, which is almost the same from Sierra Leone to the mouth of the Cuanza, there have been many important facts already published in the 'Niger Flora' of Sir W. Hooker. With regard to the second region, which comprises the districts of Golungo Alto and Cazengo, together with Dembos, and partly also Ambaca, I have reported cursorily in my letter of the 12th September, 1857, and consequently I have only to tell you something about the third and most interesting region. Pungo Andongo (more correctly "Pungo ià N'dongo") forms the centre of this region, which, as you will quickly perceive from the little I am going to tell about it, forms an African district of vegetation of its own, which I shall call the kingdom of the Equinoctial African highlands. About fifteen to twenty geographical miles from Golungo Alto towards the east, the majestic dark shady woods of this district, which are so difficult to penetrate on account of the immense climbers, disappear; the forests in general become more rare and less dense, and are mostly formed by low trees, among which the most common is a new genus of *Araliaceæ*, with a most curious habit. The ground everywhere is now less shaded, on which account a greater number of smaller kinds of plants occur, especially *Convolvulaceæ* and splendid *Acanthaceæ*. New forms, never seen in the primeval forests of the second region, now make their appearance, among which are, especially, *Amorphophallus*, a magnificent climbing *Bauhinia*, small pretty *Compositæ*, the *Ancylanthus rubiginosus*, Desf., and an extremely pretty fruticose *Rubiacea*, which at first sight looks exactly like an *Azalea*!! Where the ground changes to mountains or higher hills, there occur *Sterculiea* foliis glaucis, *Nathusia* foliis indivisis (which have not appeared before), and a considerable number of *Compositæ*, all more or less related to *Sonchus*, as well as a few species of *Helichrysum*, which remind you already of the Cape flora. There now become mixed with the forest trees *Büttneriaceæ* with bunches of large white flowers; pretty *Rubiaceæ* and *Tiliaceæ* (among others an herbaceous *Grewia*) are more and more frequent; and a kind of *Thesium* (*Santalaceæ*) tells again of the Cape flora: but, far surpassing all other herbaceous plants, in splendour, size, and richness of blossoms, appears prominently in all the less dense places of the wood a *Sesamum*, which, as I have collected many seeds of it, will soon become an ornament of European gardens. As we approach the rocky scenery of the præsidia of Pungo Andongo, the forests of *Araliaceæ* occur alternately with forests of *Pterocarpus*; and all at once quite a new world of plants, a new geographical kingdom, starts before the eye. The ground is everywhere rocky, grown over with short grasses and *Cyperaceæ*; but in the many narrow ravines the most luxuriant forest-vegetation abounds, consisting chiefly of *Leguminosæ*; *Ficus*; three species of *Nathusia*; *Apocyneæ*, forming trees with large blossoms; *Mimoseæ*, sometimes as trees, sometimes as climbers; several Asiatic *Rubiaceæ* in the form of trees (e.g. *Hymenodictyon*, Wallich); and a stately new *Monodora* (*M. angolensis*, mihi). At the foot of the rocks, and along the many little brooks, grow seven species of *Ophioglossum*, three *Schizææ*, and many Ferns, partly gold-dusted, and a magnificent tree-fern. Under these woody ferns (*Cyathea*, spec.) are found four or five *Umbelliferæ* and several curious *Rubiaceæ*. On the almost naked rocks grow fleshy *Euphorbiaceæ*; about ten species of *Commelyneæ*, with the habits of *Mesembryanthemum*, besides beautiful *Portulaceæ*, *Tillææ* (!), *Cyperacea leucocephala*; and in the brooks themselves two species of *Podostomeæ*, together with pretty *Batrachospermeæ* and *Zygnemata*. In stagnant water appear *Ottelia*, *Nymphæa*, and two *Aponogetoneæ* with blue blossoms, probably new genera. In wet meadows there occur six species of *Utricularia*, a *Drosera*, several *Campanulaceæ* (*Lightfootia*), an *Isoëtes* (*terrestris*), and a great number of small *Scrophulariaceæ* and *Leguminosæ*, as well as a kind of *Erigeron*. But now, on the steep walls of the higher rocks, what sort of viscid shrubs with scaly stems and blue flowers do we perceive? Two species of *Vellosieæ*! which, in conjunction with several fruticose Orchids that grow even on the barest rocks, cover all the mountains of Pungo Andongo. However, the before-named plants are not the only American guests of this territory. As soon as one approaches the summits (*juga altiora rupium*) of the rocky mountains, one finds the sides of the top overgrown with *Heurnia* and *Sarcostemma* (which announce the Cape of Good Hope), together with a *Cactus*, which is a RHIPSALIS; whilst on rough places there appear a *Musa* (scapo ventricoso! sæpius diametr. 5–6-ped.), a *Diploclinium* (*Begoniaceæ*) and *Erythroxylum*, spec.

But notwithstanding these curiosities, so frequently paradoxical, the splendour and variety of the flora of Pungo Andongo is not nearly exhausted. About a hundred species of pretty *Cyperaceæ* (*Cyperus*, fifty spec.), and above a hundred *Gramineæ*, in connexion with very pretty *Polygalaceæ* and *Ampelideæ*, adorn the lower plains; and whilst from the coast up to the boundary of this region I scarcely met with ten *Liliaceæ*, I was surprised to find around Pungo Andongo more than fifty species! Four spec. *Hypoxis*, above twenty-five *Orchideæ* (among them a *Disa*!) and *Commelynaceæ* occur in such abundance, that the whole of large regions appears at one time pink, at another time sky-blue. A large *Kniphofia*, of 6 to 8 feet, is the queen of the lilies, whilst several new genera allied to *Anthericum* and *Scilla*, together with *Chlorophytum*, *Sanseviera*, and pretty *Asparagineæ*, form as it were the underwood of the lilies. One *Tacca* and two *Hæmanthi*, together with *Crinum* and a small-flowered *Narcissea*, adorn the skirts of the forests, besides a countless number of little *Rubiaceæ*, with sky-blue or rose-coloured flowers. Species of *Hibiscus* appear everywhere. The *Violariæ* are represented by three *Ceranthera* in the form of small trees (one with the habit of *Ilex aquifolium*!). A *Myricacea*, with an extremely delicious powerful smell, forms quite a new genus, which is only related to *Comptonia* in the formation of the anthers; but it has, like no other *Myricacea*, opposite leaves. I have described it as *Myrothamnus flabellifolius*. *Pistia* and *Ceratophyllum*, with an *Azolla* and a *Marsileacea*, abound in the fresh water with *Polygonaceæ* and *Scirpoideæ*, accompanied almost everywhere by two or three species of *Nymphæa* (*Nymphæa Lotus*, P. de B.), whilst a *Ruppia* (similar to *R. maritima*) and several *Charæ* fill the stagnant water. Among the climbers are two species of *Hugonia*, a 5-gonous *Mimosa*, and several species of *Strophanthus*. Among others *Asclepiadeæ* are also numerous, and mostly climbers. Also an *Oleacea* occurs as a large tree; and tree-like *Euphorbiaceæ* (*Bridelia*, &c.) are found everywhere. The *Daphnoideæ* are represented by a very pretty scarlet *Gnidia*, the *Proteaceæ* by two thickheaded *Proteæ*. *Labiatæ* and *Verbenaceæ* are in great abundance everywhere; the latter and several *Acanthaceæ* mostly assume the forms of trees or shrubs. *Loranthaceæ* glitter frequently from out the dark-leaved tops of the *Combretaceæ* and *Anonaceæ*; but they occur also on *Mimoseæ*, and (in spite of De Candolle's assertion) very frequently on fig trees, even on the cultivated *Ficus Carica*. *Celastrinæ*, *Hippocrateaceæ*, and *Chailletieæ* are not numerous. Of *Myrtaceæ* were observed ten, of *Melastomeæ* only thirteen species, of *Connaraceæ* eight, of *Lythraceæ* ten or twelve species, of *Ranunculaceæ* I have five species of *Clematis*; of *Rosaceæ* I have found only one *Rubus* (*apetalus*). A *Cochlospermum*, as a tolerably large tree, is to be met with everywhere; besides, I have to enumerate five *Piperaceæ* and two *Dorstenieæ*, among which occurs a *Kosaria*. These all appear to be new species. The *Scrophulariaceæ*, of which there are about thirty species, principally adorn the meadows where they grow, with four species of *Eriospermum* (*Liliaceæ*), with several species of *Anthericaceæ*, *Drosera*, *Disa*, *Corchorus*, and *Triumfetta*. I have also found in the marshes quite a new and highly interesting Monocotyledonous family represented by five species, which in its characters somewhat resembles *Centrolepidæ*. I am firmly convinced that this new family will be received by all phytologists as quite original, and will be considered as a contribution to the filling up of the vacancies which exist to this day between the true *Cyperaceæ* and the *Enantioblastæ*. Not less variety is found in the Cryptogamic Flora of Pungo Andongo, among which particularly the *Fungi* are remarkable. *Polyporoideæ*, *Agaricoideæ*, and *Sphæriaceæ* are extremely numerous, in beautiful forms and bright colours. I have observed about 300 species; and of most of them I have collected illustrative specimens, which now all lie safely in my English Herbarium. Among the *Algæ* are especially to be noticed many sorts of *Scytonema*, which here compose, as the *Sphagna* do in Europe, the swampy ground for the so-called peat plants (*plantæ turfosæ*), and in whose thickly-matted turf *Droseræ*, *Utriculariæ*, a kind of *Xyris*, and many *Hepaticæ* and *Musci* usually take root. Of *Musci* there were in all about eighty species, of *Lichenes* above a hundred; of *Filices*, on the whole and including the insulares, nearly a hundred species, among which are two *Filices arboreæ*, two *Platyceria*, two *Lygodia*, three *Hymenophylla*, one *Marattia*, one *Gleichenia*, &c. There are rarely met with more than six kinds of *Lycopodia*, for the most part extremely pretty *Selaginellæ*. I must also remark, with regard to the *Algæ*, that two *Rhodophyceæ*, namely, two *Hildenbrantiæ*, are found in the brooks between Golungo Alto and Pungo Andongo, and indeed in such abundance, that certain parts of the brooks assume a blood-colour or purple dye.

The haste with which I have been compelled to compile this letter will be in some degree an excuse for the confusion which would necessarily follow in enumerating the different families, as I have mentioned them only just as they presented themselves one by one to my memory. However, I permit myself to express the hope that this enumeration, although rather confused, will at least be sufficient to give a general idea of the riches and variety of the flora of the interior of Africa. As soon as I have put my herbarium in better order, and have arranged, in a preliminary way, those plants which can only be determined in Europe, I intend to give a general summary of all the plants which I have observed on the continent and the adjacent islands, together with indications relative to their propagation and distribution. As regards the collection of insects I have made in Africa (among which the *Coleoptera* especially are very numerous, and also the *Hymenoptera* not unfrequent), I have communicated to Mr. S. Stevens some general remarks. With regard to the wishes of Mr. D. Hanbury, I may remark that I have collected about eighteen species of *Scitamineæ*; but from want of time I have made no drawings of their flowers, for I am a very bad and slow draughtsman: however, most of the species are very tolerably preserved, even as regards the flowers and fruit. Pray remember me kindly to Sir W. Hooker and R. Brown. I have been much pleased to find, even in the place itself, almost all the prophecies confirmed which R. Brown pronounced in his celebrated Appendix to Tuckey's Travels: this appendix was my gospel. It is very true, that I could have worked more effectually during my long stay in equinoctial Africa, if I had not had to fight again and again with fever, scurvy, and dysentery, which is in some degree but natural; for I had to penetrate the densest woods, to examine the deepest ravines, and to wander for miles slowly under a burning sun through marshy land, whilst common travellers are moved along, lying comfortably in hammocks, only on roads. (Sapienti sat!)

With the assurance of my greatest esteem and gratitude, I remain your most obedient,

Dr. Friedrich Welwitsch.

Dennisonia, *Barklya*, et *Laboucheria*; genera floræ Australiæ nondum cognita. Descripsit Dr. Ferd. Mueller, S.L.S., etc.

[Read Jan. 20, 1859.]

DENNISONIA, n. g. VERBENACEARUM.

Calyx subcampanulatus, quinquefidus. *Corolla bilabiata*; labio supero breviore bifido; labii inferi tripartiti lacinia media majore; tubo cylindraceo subincluso intus barbato. *Stamina* quatuor didynama, omnia fertilia, infra faucem corollæ inserta, emergentia. *Antheræ* biloculares inter loculos affixæ, loculis ovatis divergentibus rima longitudinali hiantibus. *Stylus* filiformis apice breviter bifidus, cruribus acutis. *Drupa exsucca* nucamentacea, obovata, calyce inclusa, dipyrena, basi perforata, pyrenis bilocularibus arcte cohærentibus. *Semina* in loculis solitaria, erecta, parce albuminosa. *Radicula* brevis infera.

Frutex Australiæ borealis concinnus, glandulosus, pube ramosa articulata vestitus; *foliis verticillato-ternis* acute ovatis sessilibus serratis; *floribus axillaribus solitariis* bibracteolatis breviter pedunculatis, corollis roseis coccineo-venosis.

Genus habitu eximium, characteribus autem *Newcasteliæ* et præsertim *Pityrodiæ* valde cognatum, cum summa veneratione et gratissimo animo dicavi viro præillustrissimo Guilielmo Dennison ordinis balnei equiti, coloniarum Australiæ gubernatori, scientiarum artiumque hinc elato patrono et cultori, qui ad perlustrationem Australiæ intratropicæ phytologicam benignissime mihi obtulit facultatem.

Dennisonia ternifolia.

In rupibus originem versus fluviorum M'Arthur et Seven-Emu River ad sinum Carpentaria Gulf.

BARKLYA, n. g. CÆSALPINEARUM*.

Calyx ebracteolatus campanulatus breviter 5-dentatus; dentibus æqualibus v. summis minoribus. *Petala* 5 subæqualia obovato- v. orbiculari-spathulata longe et tenuiter unguiculata æstivatione imbricata uno ex infernis exteriore? *Stamina* 10, omnia fertilia breviter exserta cum petalis *basi calycis affixa*, libera, alterna paullo breviora. *Antheræ* sagittatæ versatiles eglandulosæ, loculis longitudinaliter dehiscentibus. *Ovarium* stipitatum, 3–4-ovulatum, glabrum. *Stylus* brevis filiformis. *Stigma* minutum truncatum. *Legumen* stipitatum compressum glabrum reticulato-venosum oligospermum, isthmis cellulosis imperfecte loculatum. *Valvæ* oblongo- v. ovato-lanceolatæ chartaceæ. *Semina* albuminosa compressa oblique ovata hinc truncata. *Strophiolum* nullum. *Cotyledones* rectæ planæ. *Radicula* brevis arcuato-incumbens hilo proxima.

Arbor Australiæ orientalis subtropicæ admodum venusta; *foliis* coriaceis *simplicibus* cordatis palmatinerviis; *racemis* elongatis conferte multifloris; *pedicellis* solitariis; *petalis* aureis.

Genus *Moræ* forsan propinquum gratissima mente et summa observantia dicatum viro excellentissimo Henrico Barkly, ordinis balnei equiti, coloniæ Victoriæ gubernatori, scientiarum fautori prænobilissimo.

Barklya syringifolia.

In sylvis ad flumen Pine River detexit amiciss. et clariss. W. Hill.

LABOUCHERIA, n. g. MIMOSEARUM.

Flores hermaphroditi regulares. *Calyx* infundibulari-campanulatus quinquedentatus. *Petala* 5 libera spathulato-ovata æqualia. *Stamina* decem libera glabra breviter exserta, omnia fertilia cum petalis infra faucem calycis inserta. *Antheræ* ovatæ introrsæ dorsifixæ biloculares, loculis rima longitudinali dehiscentibus, *connectivo* apice compresso *semiorbiculariter producto*. *Germen* dense pubescens. *Stylus* crassus brevissimus glaber. *Stigma* minutum concavum.

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* The specimens are not sufficient to make out the æstivation of the corolla satisfactorily; but it appears to me, that one of the lower petals is the external one: the habit and other characters in the flower are those of *Cæsalpineæ*, of the subtribe *Cynometreæ*; whilst the incurved radicle would place it in the *Sophoreæ*, where I know of no genus at all allied to it.—G. B.

Legumen oblongum continuum bivalve plano-compressum oligospermum. *Semina* rotunda compressa strophiolata.

Arbor Australiæ intertropicæ inermis; *foliis* abrupte bipinnatis bijugis, pinnis paucijugis; *racemis* lateralibus et axillaribus spiciformibus; *petalis* parvis virentibus.

Genus *Adenantheræ* proximum maxima cum pietate tributum præclaro Henrico Labouchere, rerum ad colonias spectantium summo ministro, sub cujus auspiciis alteram expeditionis Gregorianæ partem fauste perduximus.

Laboucheria chlorostachya.

A plagis boreali-occidentalibus Australiæ usque ad flumen Burdekin tractus orientalis, tam in solo fertiliore quam steriliore planitierum montiumque satis frequenter obvia.

Illa arbor infelicissimo nostro Leichhardtio "Leguminous Iron-bark tree" nuncupata huc pertinet.

Dabam ex horto botanico Sydneyano, idibus Martii 1857.

Note on the Morphology of the *Balsaminaceæ*.

By Prof. HENFREY, F.R.S., F.L.S.

[Read Dec. 2, 1858.]

THE different theories which have been proposed to explain the irregular character of the flower of *Impatiens* are briefly enumerated in Lindley's 'Vegetable Kingdom' (p. 490), where the view of Kunth is adopted, namely, that the organ standing on the opposite side of the flower to the spurred sepal consists of two confluent sepals, which, with the spurred sepal and the two small lateral sepals, make up a 5-leaved calyx; while in the next circle a petal is suppressed which should stand before the line of junction of the two confluent sepals. An apparently accidental confusion exists, however, in the description of the flower of *Balsaminaceæ* given by Dr Lindley: the spurred sepal is correctly stated to stand next the axis of inflorescence (posterior); nevertheless the supposed "double sepal" on the opposite side of the flower is called "dorsal" and "back-piece," notwithstanding that it stands in front within the subtending bract. This *lapsus* is rendered more serious by the woodcut of the diagram of the flower of *Impatiens* being reversed, so as to show the spurred sepal in front.

Kunth's view, supported by Walker-Arnott, and adopted by Lindley, was, we think, sufficiently refuted by Rœper (Linnæa,

ix. p. 112), from the consideration of the structure of the genus *Hydrocera.* Through the kindness of Dr. Hooker, I have seen further observations by himself and Dr. Thomson, which not only confirm Rœper's view, in reference to *Hydrocera*, but illustrate it further by certain East Indian species of *Impatiens*, in which the number of sepals is either regularly or occasionally the same as in *Hydrocera.* In this genus the calyx has five sepals: first, the posterior spurred sepal; next, two lateral sepals, corresponding to the two small and usually green sepals of *Impatiens Balsamina*; with two anterior sepals, which are mostly suppressed in *Impatiens.* Within this circle occurs a whorl of five petals, the anterior one being the so-called "double sepal" of Kunth, which is *inside* the two anterior sepals just referred to.

Payer (Traité d'Organogénie végétale) states that he finds the rudiments of this pair of anterior sepals on very young buds of *Impatiens Royleana.* I have not been able to find them in the Garden Balsam, nor in a developed state in the numerous monstrous specimens which I have examined. On the other hand, the monstrosity presently to be described favours the doctrine of Rœper far more than that of Kunth. In order to explain it more clearly, I have appended diagrams of the normal structure of *Impatiens* and *Hydrocera* (figs. 1 and 2).

It is a well-known fact that the common Double Balsams of our gardens produce seed freely. Since only one circle of stamens exists, we should scarcely have expected this; but the fact is that an extra corolline whorl is produced without the suppression of the stamens, and the metamorphosis takes place in a manner which bears an interesting relation to certain general questions of morphology, as well as to the theory of the flower of *Impatiens.* In the common Double Balsams of our gardens the flowers usually present a natural calyx, the small lateral sepals being often more or less coloured, and sometimes gibbous or slightly spurred; I have never found the two anterior (suppressed) sepals developed. Within the calyx stand five petals (a broad anterior one and two pairs of lateral petals), which are, as usual, mostly more or less adherent by their limbs on each side, but with their claws free. Succeeding these are found five free petals resembling in appearance the lateral petals of the previous whorl, standing in the usual place of the stamens—that is, alternating with the normal petals, as shown in the diagram (fig. 3). Next comes a circle of five stamens, mostly all perfect, alternating with the preceding circle, and therefore in the ordinary place of the carpels. Lastly, the five-celled ovary has its carpels alternating with the stamens so that the odd one is necessarily posterior instead of anterior, as in the normal condition.

Here therefore we have a case of "doubling" distinctly referable to an absolute increase in the number of whorls of organs; for the regular alternation of the organs of successive whorls, both in the normal and monstrous forms of the same flower, precludes the idea of any development of usually suppressed organs, and of any *dédoublement* or *chorisis*, to which recourse is had, perhaps too frequently, for the explanation of double flowers.

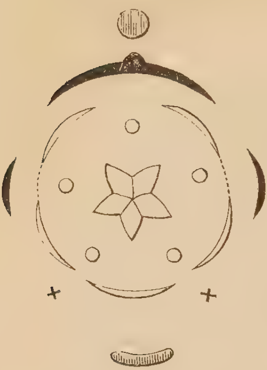
Such multiplication of whorls doubtless occurs to a considerable extent in cultivated plants, especially in genera with few stamens and carpels. In the double Daffodil there are found forty or fifty petaloid organs, while the flower naturally contains only fifteen organs; and each piece exhibits a more or less perfect lobe at the junction of the claw and limb, showing that there is no *chorisis* causing the separate development of the coronal lobes.

In most cases of doubling we find more or less of the organs abnormally developed, rendering the conditions somewhat obscure; but in these Balsams the circles are formed of perfectly natural structures; and there is a point of physiological interest in the throwing forward of the functions consequent upon the conversion of the organs. The stamens are replaced by petals, the carpels by stamens; and an additional whorl of carpels is produced at the summit of the axis. Generally speaking, the stamens are well-developed; but now and then one or two are found sterile, or surmounted by small petaloid lobes.

These monsters are more favourable to Rœper's than to Kunth's view; for, if what we regard as the anterior petal were a "double sepal," we should expect to find a petal developed within it, opposite its commissure, which was never the case in any of the very numerous specimens examined.

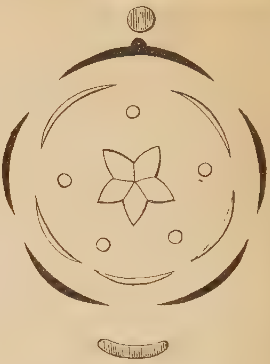
Somewhat related to the above metamorphoses are the conditions described by Al. Braun in *Delphinium* (Pringsheim's Jahrb. f. Wiss. Bot. 1857, i. 206). In that genus the stamens and carpels are members of a continuous spiral series, not of successive whorls. In *D. cardiopetalum* the spiral is (approximately) $\frac{3}{8}$; so that the 9th organ is opposite the 1st, &c. In cases where 16 stamens were found, the first carpel, being the 17th organ of the series, stood opposite stamens No. 9 and No. 1; the second carpel (18th organ) was opposite stamen 10, &c. (fig. 4). In another case 18 stamens were developed before the carpels appeared, in which case

Fig. 1.



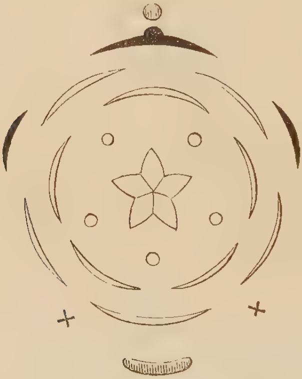
Impatiens Balsamina.

Fig. 2.



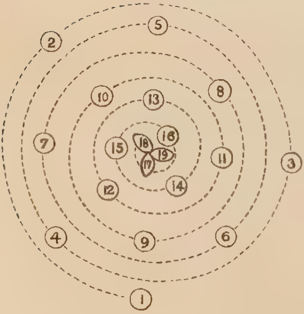
Hydrocera triflora.

Fig. 3.



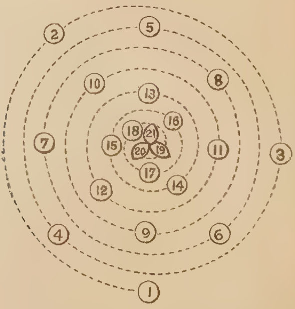
Double Garden Balsam.

Fig. 4.



Delphinium cardiopetalum
(16 stamens and 3 carpels).

Fig. 5.



Delphinium cardiopetalum
(18 stamens and 3 carpels).

the first carpel (organ 19) stood opposite stamen No. 11; the second carpel (organ 20) opposite stamen No. 12; and the third opposite No. 13 (fig. 5). This advance of the stamens, driving forward the carpels, is still more clearly seen when only one carpel exists, since this then stands, according to circumstances, in an anterior, lateral, or posterior place. These conditions seem exactly comparable with the advance of the stamens in an entire whorl, and the production of a new whorl of carpels, such as I have described in the double Balsam.

On the Arborescent Ferns of New Zealand. By THOMAS SHEARMAN RALPH, Esq., A.L.S.

[Read Dec. 2, 1858.]

THINKING that some observations on the Arborescent Ferns of New Zealand may interest the members of the Society, I have thrown them into the form of a paper; and I have also forwarded specimens to illustrate the various points which I think are either unnoticed or are most worthy of remark.

Of the four species of *Cyathea* described in Dr. J. D. Hooker's 'Flora of New Zealand,' the most prominent one is the *C. dealbata*, or Silver Fern, known by its straight upright stem and white fronds. It is by far the commonest species, and grows in all situations, from the stream in the bottom of the gully to the very tops of the highest hills (in the south part of the north island), where perhaps it is more inclined to form groups.

C. medullaris, or Black Fern, can be recognized in the early stage, before it has made much stem, by the very long fronds mounted on long black stipes, rising almost perpendicularly upwards, while its greater height and more solid appearance of stem mark it out at an older stage.

C. Cunninghami is scarce, and likely to be often passed over as *C. Smithii* in the dark recesses of the gullies in which it chiefly delights to shelter itself; but it may, after some acquaintance, be picked out of the crowd at a little distance. When very young, its stem is entirely covered with the remains of the black bases of the stipites, from which the dead fronds dangle all the way up, giving it a very untidy and ragged appearance. The darker hue of its fronds, which in the older state of the plant are as many as thirty or forty in a head, and form a funnel-shaped crown, serves also to distinguish this species from—

C. Smithii, whose delicate spreading fronds of brighter green are mounted on a stem which is furnished with a wiry fibrous structure, and whose top is adorned (?) with the remains of the stipites of dead fronds, hanging closely to the stem, from sixty to seventy in number, but all *divested* of the pinnæ. This is what may be seen in the bush when uninjured by the action of violent winds. Thus much for a glance at these species; a more detailed account I now give, from investigations carried on uninterruptedly during three months.

C. dealbata (White or Silver Fern) presents two or perhaps three forms; but the characters are scarcely marked enough to make out so many varieties. One state of the fern is marked by the frond being furnished with sori well within the margin, thus giving the appearance of a broader pinna, &c.; another form appears to be characterized by a more delicate frond; while a third is a coarse or hard-fronded form, with a yellowish hue along the upper side of the main and partial rachis, and which is perceptible at a distance—the pinnules are also inclined to curl inwards at the margins: this may be termed the full-fruited form, as the sori are very abundant.

No decided character can be drawn from the persistence of the bases of the dead fronds. I have seen these stipital remains covering a stem (of *C. dealbata*) from top to bottom, in others halfway up, in some on one side only; seldom, however, is the stem entirely bare, but a wiry fibrous structure (aerial rootlets) issues out and covers it more completely. When this tree-fern has attained some size, the base gradually enlarges by the addition of these fibres, till it reaches perhaps a foot and a half in diameter. The greatest height to which it seems to attain is about 24 feet. The fronds vary from 8 feet to 12 feet in length and from 2 feet to 3 feet in breadth, and they spring out nearly horizontally from the crown.

Although the fronds are so beautifully white underneath, it is almost impossible at times, even in open places, to be sure one sees a white-fronded fern; but a blow from a stick or a wave of the wind is necessary, to turn but a little portion of the frond, in order to satisfy the observer that it is white beneath.

C. medullaris (Mamaku, or Mamagu of the natives, Black Fern of the settlers).—This fern may be recognized at a very early stage of its growth, and before any trunk has been developed, by the general form and texture of the young frond. The main rachis is usually of a very dark-brown or black colour. When it has formed a stem, it will be observed that these black stipites are closely pressed to its sides and spring upwards nearly straight and almost parallel with the direction of the stem, till the first or lower pinnæ are produced, even to a distance of five, six, or more feet; from this point the frond springs outwards, and, carrying its breadth well up into the air, brings its apex out a little below the body of the frond. The rachis is rough to the touch, and rounded in form, with a perceptible channel or mid-groove commencing some distance above the base. [A portion of the rachis cut off here, for three feet or more, has very much the appearance of a double-barreled gun, from the groove and the dark colour.] Lower pinnæ alternate, ascending nearly at right angles with the rachis, while the succeeding ones gradually assume the horizontal direction (from the rachis). Fronds coriaceous, usually of a bright shining green above, paler beneath, 6–9 springing out at once, and at this stage of its growth appearing to be rather brittle.

When this fern has made a stem of ten feet or more, it will be noticed that the stem is ragged, from the remains of the fallen fronds, the stipites of which, often empty of cellular matter, hang merely by the internal fibres and outer black shell-like covering. When these last have decayed away, the fibres in connexion with the scars on the stem still stand out like so many dried-up grassy tufts. Should the stem at this time begin to form its dense, matted, granular addition, which it puts on sooner or later, and by which the stem is greatly increased in diameter up to a variable height, then these persistent fibres occasion the additional growth to protrude over them, thus making this portion of the stem appear more knobbed than it otherwise would do. As this fern usually grows on the side of a gully, and generally on one side of it in preference to the other, this additional growth is always greater in thickness towards the centre of the gully and away from the bank, and gives the lower part of the stem a kind of rough-triangular form. This growth sometimes attains a girth of six or seven feet, extending in a gradually lessening deposit upwards to a height of perhaps ten or more feet from the ground.

This is a provision of nature applied to the weaker side of the stem, occasioned by the damp and moisture trickling down the stem, and provides a firm buttress to the lofty rise of the stem, which sometimes attains a height of forty or fifty feet, and even, as it is said, of eighty. The trunk seldom rises straight up, but takes a bend or stoop, and always towards the gully, as if it experienced a great weight of fronds; and having formed this additional prop, it seems to recover strength and determination to ascend more straightly than before.

It is to be observed that as the stem attains a height of ten feet, or thereabouts, the stipites become shorter, or, in other words, the pinnæ are set closer to the base of the stipites—but these last still continue close-pressed to the stem,—that the black colour above is replaced by a yellowish green, and greater asperities make their appearance beneath, and are extended now all the way up the rachis. The rachis in its outline is altered from the rounded to a flattened form; and as it springs from the stem, it assumes a gentle curve, so as to bring the frond to a horizontal position. The fronds are now seldom more than twelve feet in length, and of such a weight as to require considerable effort to raise them off the ground by one end in order to shoulder them, when one may be readily carried. At this more mature stage of growth, the fronds, when fully ripened, decay somewhere about six inches from their insertion into the stem, and no doubt suddenly fall from their horizontal position to a pendent one, and remain suspended perhaps during the greater part of the winter, giving a majestic tree fern the appearance of wearing a clothing of matting, much like a native chief. These fronds ultimately fall off, and leave the stem almost bare, so as to show the scars. This fern is seldom beset by climbing plants,—a circumstance possibly due to the long persistence of the stipital remains.

If the stem of *C. medullaris*, of a height varying from 20 to 40 feet, be examined, the following will be the features it will present. A large, rough, black, triangular-shaped buttress tapering upwards to 6 or 8 feet, when the original stem will most likely be seen marked with elliptical-shaped scars of 6 or 8 inches in length and about 3 in width. As the eye is carried higher up, these scars will be seen to be set closer together, and to become altered in form; and at a height of 20 feet and upwards, they become nearly hexagonal, and very regularly placed; so that six of them occupy the circumference, while the six above and those below alternate with them. The woody matter at this part is very hard and heavy with sap.

I have counted about 34 or 36 fronds in full vigour in one crown at one time; and, supposing that a circle of fronds attain their full growth and live only six months, it will be seen that these ferns are slow growers.

The linear form of the scars below accords with the brittle nature of the rachis and their mode of intortion, by which a great amount of weight is taken off from the young and soft stem,—while the advanced stage of growth is marked by the addition of a buttress, more closely-placed scars, harder woody structure, and heavy *horizontally*-placed fronds. I feel almost certain that the different appearance of the young- and the older-formed fronds has given rise to the idea of two species, not only in these islands, but also, in some descriptions, in other places.

I now come to the other two Cyatheas; namely, *C. Cunninghamii* and *C. Smithii.* I have found considerable difficulty in making out these two species even when accompanied with plates and descriptions.

C. Cunninghamii, or Warted Cyathea, as I have called it for distinction.—This fern is seldom met with, except in the vicinity of streams in the bush; and where this is cleared away, I think it ceases to increase. It appears to me to be less able to resist exposure than either of those already described. It attains a height of 20 feet, or perhaps more, and forms a basal fibrous structure, much resembling that of *C. dealbata*, which extends about 5 feet up. The stem is characterized by the remains of the black persistent bases of the stipites, which are mostly close-pressed to the stem for a foot or more; and these, being hollow from decay of the cellular substance, often contain plenty of water, and give the stem, which is comparatively slender, a ragged, untidy appearance. The young fronds, or rather as they emerge from the fern, are fully charged with scales, which, on the main rachis, appear to me to point towards the base, and not upwards to the apex, of the frond. The fronds are heavier than in *C. Smithii*, and appear from 20 to 30 in a crown. Rachis marked with linear warty scars on either side, besides presenting a remarkable warty or glandular (?) opening situated at the base of each pinna springing from its sides. Sori numerous, generally on all the pinnæ; the fertile fronds appear sometimes to be alternate, and are more contracted than the barren ones.

I have called this the *Warty* Cyathea, to give it a local English name, as the others are termed black and white, &c.

C. Smithii, or acorn-fruited Cyathea.—This fern also is most frequent in the immediate neighbourhood of streams, at the bottom of well-sheltered gullies. Soil wet or swampy. Stem fully 22 feet high, densely fibrous below, a little resembling that of *Dicksonia antarctica* (at the base), and remarkable for the dead *pinnaless* fronds, or rather raches, hanging from the upper part. Fronds lanceolate, bipinnate, bright shining green, 8–9 feet long, and very light: pinnæ 20–22 pairs, springing from the upper rounded surface; lower short and erect; middle ones gradually assuming the horizontal position. Veins simply pinnate in barren fronds, forked in fertile ones. Indusium truly cup-shaped, open above, and protruding the compactly arranged sporangia to double the distance; they are covered by it below; receptacle large and club-shaped. I believe the cup *never* covers the sporangia. The main rachis is brownish, channeled above, rough beneath with minute points, the sides being covered at their early stage with soft scales or paleæ, as also are the partial ones. Warty scars situated *between* the pinnæ and on the sides of the rachis.

Note. This fern wants the characteristic sudden acuminate point of the pinnæ, so remarkable in the other three species.

I first noticed this species springing from a trunk which had been buried in the side of a gully by the falling in of the soft upper soil; and it had formed a stem 6 feet high, rising up at a right angle from the stem. I subsequently noticed many other specimens both of this species and of *C. Cunninghamii* similarly circumstanced.

I have sent with the stem-sections some natural skeletons of the stem of *Cyathea medullaris*, which may be of service to compare with some geological remains. I think it is evident also that the natives of New Zealand have taken their scroll-like ornaments, in their houses, &c., from the gyrate fronds of the large ferns, and also from the curious markings on the long scars of the stems when they have decayed off the cellular substance. These stems were in use as fencing, round their paas or villages. (See 'Illustrations of New Zealand Scenery,' &c.)

Dicksonia antarctica.—This tree-fern is getting scarce about Wellington, while *D. squarrosa* seems to be met with rather more freely. A specimen of a stem, which I have sent, was part of one 5 feet high. There was another which stood by, 12 or 15 feet in height; but I had not the heart to cut it down. The lowest part of this last was hard and fibrous, and very different from the specimen sent; but the upper half was so soft, that I could impress it easily with my fingers. The lower portions had become hardened, partly from the decay of the very soft woolly substance which exists so abundantly at the bases of the stipites, and also from the increase in size of the root-like fibres which penetrate the woolly portion. This woolly substance, of a beautiful auburn colour, serves to retain a great amount of moisture around the rootlets which emerge from between the stipites, and facilitates their growth. A transverse section of the stem varies considerably, according as it is cut high up or low down, as may be seen in my specimens. A section taken 3 or 4 feet from below the head gives us a woody centre or cylinder, and around it an immense mass of a very dry light-brown substance, penetrated by root-like fibres, without any trace of a stipe-like nature. A section, taken 2 feet above this, gives the cylinder closely surrounded by transverse sections of the remains of the stipites,—some 50 or 60, or more, remaining distinct, close-pressed and packed together, with traces of fine hair-like fibres, which clothe the bases of the stipites. Outside these is a surrounding mass of a looser and coarser texture, consisting of a mass of matted fibres of a root-like appearance, and decaying stipites, which have almost lost their form in the general decay. On making a vertical section (and this I believe is best done in recent fern-stems by splitting them with a wedge in place of sawing), it will be seen that the woolly substance closely invests the bases of the stipites, which are deeply buried in the substance of the woody cylinder; and a number of rootlets may also be traced issuing outwards: these, I think, sometimes ascend and then turn downwards, increasing, and penetrating the decaying stipites, and in process of time forming a tangled mesh or net-work of a coarse kind, and which remains after the decay of the fine hairy fibres and the stipital bases. Perhaps this state of things has led to the enumeration of a third species of *Dicksonia* in these parts. As yet I have only met with two.

D. squarrosa.—The fronds are about 8 to 10 feet long; stem 16 feet, &c., slender; small rootlets spreading in irregular masses here and there, and forming irregular growths, which ultimately unite, but no appearance of a coating of a fine fibrous nature. The black stipites run up the stem for a foot or more, and ascend clear of the head 18 inches or 2 feet before the lower pinnæ appear, being clothed with inch-long, erect, brownish-black hairs or setæ, springing from the upper surface and sides of the stipe; rough, with minute tubercles; branching rootlets, tufted with brownish tomentum issuing upwards from between the stipites. The very young gyrate fronds are clothed with auburn hair.

The Indian Species of *Utricularia*. By DANIEL OLIVER, Esq., Jun., F.L S.

[Read Dec. 16, 1858.]

SOME few months ago Dr. J. D. Hooker was kind enough to entrust to me, for arrangement, the very valuable collection of Utricularias brought together by himself and Dr. Thomson during their recent Indian journeys, with also an ample series of the Southern and Ceylon species collected by the late Dr. Stocks, and the numerous excellent botanists whose contributions are acknowledged by the authors of the 'Flora Indica' and the 'Præcursores.' In addition to these, moreover, I may mention the important series in Griffith's extensive herbarium, until recently in the keeping of the East India Company, but now, through the exertions of Dr. Hooker, in course of arrangement at Kew. From the excessive entanglement of the nomenclature of this interesting genus, at least of its Indian members, I found it needful thoroughly to re-examine nearly every form, and to work them up in the first place almost *de novo*, irrespective of their literature; and it is in the trust that the views which I have felt myself required to adopt, as to the limitation, &c. of the species, may serve as a stepping-stone to their more complete illustration, that I venture to lay before the Linnean Society the result of my inquiries. A few species from the temperate region of the Himalaya are new, and especially demand publication, from their common peculiarities.

In the elaboration of these plants, I have derived great advantage from the herbaria of Sir William J. Hooker, of G. Bentham, and Dr. Wight, which have been most freely placed at my service; these, with our Wallichian and Smithian collections, and the important fasciculi preserved in the British Museum, have been invaluable in determining their synonymy, otherwise quite inextricable, as well as their range in respect not only to variation in form, but also of geographical distribution within the borders of the Indian empire. Unfortunately, the insufficiency of material, particularly as to North Australian and African species, and, to some extent, to those of the Eastern Archipelago, precludes any satisfactory working-out of their general distribution; and upon this head, from the importance of absolute accuracy in the identification of species, I feel it the safest course to say but little. I have especially to congratulate myself on the ample suites of specimens which have been placed in my hands illustrative of each or of most of the species. I have thus been enabled to dissect and compare numerous examples, and have been spared the contracted views of their specific limitation, which, with less ample material, I should surely have adopted. The chief difficulties in their study I have found to arise from the extreme brevity and insufficiency of the older descriptions, and the multiplication of 'book species,' founded upon the unwarrantable data afforded by solitary or very imperfect specimens. The examination of the parts of the flower in the Utricularias, also, is a labour absorbing much time, from the care required in their dissection, resulting less from any structural complication than from the marked tenuity of the corolla,—while the frequent variability, even in the same species, in the form of parts upon which important characters are often based, demands an attentive comparison of examples. The settlement of the synonymy of several species, and the reduction of those specific names which have been applied either to individual varieties or to mere forms, has been, I hope, not an unuseful result of their study.

The more important recent contributions to our knowledge of these plants are the papers of Benjamin, in the 'Botanische Zeitung' and the 'Linnæa;' of Edgeworth in the 'Proceedings of the Linnean Society;' of Dalzell in the 'Kew Journal of Botany;' and the figures and descriptions in the 'Icones Plantarum Indiæ Orientalis' of Dr. Wight. With regard to the descriptions of the first-named author (although generally drawn up with care, yet founded too often upon very imperfect and incomplete examples), I should have felt them particularly embarrassing, were it not that, in the herbarium of Sir W. J. Hooker, I have had access to specimens of many of them authenticated by his own labels. The contribution of M. P. Edgeworth, contained in the first volume of our old 'Proceedings,' I should have most certainly overlooked, had not J. J. Bennett kindly called my attention to it. Its most important feature is the description of a supposed new genus of *Lentibulariæ*, under the name of *Diurospermum*, from the Western Himalaya. It would appear that no specimens of this plant have been sent over by the author of this paper; at least, in the herbaria to which I have referred, none are to be found; but I feel tolerably confident that his plant may be recognized in a small and very interesting species collected in Kumaon by Strachey and Winterbottom. I account for one or two little discrepancies by the assumption that Edgeworth's specimens have been either few or in an advanced state of growth, the chief difference between the description of his plant and that of S. and W. being the lobate upper segment of the calyx of the former. I find, in one or two *Utriculariæ* of this group, that this lobe of the calyx, originally entire, or at most retuse or emarginate, often splits more or less towards maturity, thus presenting quite a bilobate form. The appendaged seeds are very remarkable; but in this respect they differ from other Himalayan species of the same series (including the well-known *U. orbiculata* of Wallich) merely in the form of the produced epidermal cells of the testa, which, as noted by Dr. Wight, in this latter species are glochidiate or capitate, while in the Kumaon plant they are elongated hairs from the extremities.

The Sikkim and Khasia collections of Dr. Hooker include two or three new species belonging to the same group with these plants; but I have not been fortunate enough in every case to meet with matured seeds, the further examination of which is very desirable. These singular Utricularias constitute a most interesting section of the genus, characterized by small stature, orbiculate, reniform, or obovate-spathulate leaves, very unequal calyx-lobes, the lobed, more or less plane, lip of the corolla, and (so far as sufficiently matured specimens enable me to speak) the appendaged seeds; perhaps, too, the dehiscence of the capsule, and the ultimately more or less reflexed inferior lobe of the calyx, may be common to them. Although these characters confer a striking individuality, yet I do not discover that the species presenting them are entitled to a rank superior to that of a subgenus. They are, too, so essentially *Utriculariæ*, that by separating them we should open a door yet more widely to a destruction of the genus as interpreted in books—already, indeed, impending from the separation, by some writers, of certain South American forms. It is perhaps possible that a carefully conducted series of observations upon the embryo and structure of the seed may lead to a different conclusion; but until such observations are forthcoming, the more correct course is undoubtedly to retain them as a section of the genus. Dr. Wight, in his valuable 'Icones' (vol. iv.), figures and describes twenty-three species. Some of these, in most cases identified in his herbarium, after examination and comparison with other series, I have thought it quite impossible to maintain, and have accordingly reduced them. Dr. Wight particularly observed the characters afforded by the surface and form of the seed in certain species, resting, in some cases, important specific characters upon them. I have examined the seeds of many species, and believe that marked characters, available in their discrimination, are, in some instances, afforded by them. The variety in their form and surface is striking; but we are yet very deficient in information as to whether parallel differences are presented in the internal structure of the seed, which it is extremely difficult to investigate in many instances—in part from the excessively oleaginous nature of the cell-contents, and perhaps, too, the relatively small or imperceptible cotyledons. Of the older descriptions of Indian *Utriculariæ*, the most important are those of Linnæus and Vahl. From the accumulation of species subsequent to their period, the extreme brevity of their notices, and the imperfection of the absolute material upon which they were framed, it is very difficult, and frequently indeed impossible, to arrive at a confident determination of their species. When authentic specimens have been accessible to me (as in the case of the Linnean Herbarium) corresponding sufficiently nearly with the published descriptions of the author, I have adopted the Herbarium names; in the case, however, of a few of Dr. Kœnig's plants in the collection of the British Museum, which appear to be unusual or aberrant forms of frequent species, or else very imperfect and insufficient for positive determination, I have not thought it desirable to disturb nomenclature unduly by the adoption of the Vahlian names which, with reason, may be supposed to apply to them. Examples of a *Utricularia*, however, in that herbarium, from Dr. Kœnig, bearing the name *U. flexuosa* Vahl, together with the description of that species in the 'Enumeratio Plantarum,' compel me to give it its fair precedence, at the sacrifice of Dr. Roxburgh's generally adopted name, *U. fasciculata.*

In the distribution of the Indian species in this paper, for the purpose of ready reference, I have availed myself of sectional characters, based upon, chiefly, the presence or absence of a leafy axis, whether submerged or terrestrial; the attachment of the squamæ* and bracts; the length of the pedicels; the direction and

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* I employ the word '*squamæ*,' with previous writers, to denote the minute empty scales attached, like the bracts, sometimes by the base, sometimes about or below the middle, to the scape. Although the transition to these from the true leaves at the base of the scape, or, when present, from the capillary segments of the submerged axis, may be very abrupt, I take them to be reduced foliar organs, referable probably to the 'hypsophyllary' series, and corresponding to similar appendages in *Pyrola*, &c.

At the base of the pedicel, in nearly all of the Indian species destitute of a floating axis, are found, by and within the bract (as noted in the sectional chaproportion of the spur of the corolla; the comparative proportions of the calyx-lobes, &c. The sections of A. De Candolle employed in the 'Prodromus,' of questionable utility in their general application, are almost useless in the apportionment of the Indian species.

Finally, I may be allowed to express my conviction, that in the investigation of the development and general morphology of the 'Bladder-worts,' there is a wide field for extended observation; and I believe that a monograph of the genus, thoroughly worked out in respect to these, would be, although a work of much labour and difficulty, a most valuable contribution to science.

UTRICULARIA, *L.*

§ I. *Scapi ex axi demerso, segmentis multisectis plus minus capillaceis sæpissime aciculiferis, per florescentiam persistente. Bracteæ solitariæ* (i. e. *bracteolæ nullæ*).

A. *Scapus vesicis inflatis in verticillum unicum dispositis instructus* (vide obs. sub *U. flexuosa,* infra.).

1. U. stellaris, *L.*; *Wall. Cat.* 6400; *A. DC. Prodr.* viii. 3; *Wight, Icones,* 1567.

Loc. Per totam Indiam tropicam. Moradabad, *hb. Hook.*! Rohilkhand, *Edgew.*! Concan, *Stocks*! Tanjore et Orissa, *Wight*! Carnatica, *Kœnig.* &c.! Khasia, *hb. Griff.*! Forma macrocarpa, Nipalia, *Wall.*! &c.

Distrib. Nubia, *Kotschy*! Africa aust., *Dreg.*! (Nov. Hollandia bor., *Mueller*?)

Scapi supra v. infra medium vesicis circiter 3–5 lanceolatis oblongis v. ovato-oblongis apicem versus filamentis capillaribus plus minus ramosis instructis in verticillum sæpissime dispositis. *Pedicelli* apice sæpe incrassati fructiferi patentes v. deflexi capsulam æquantes v. excedentes.

Corollæ labio superiore ovato v. rotundato obtuso calyce sæpe duplo longiore, calcari brevi saccato obtuso v. alabastro emarginato corollæ

racters), a pair of very small laterally disposed laminæ, which I call *bracteolæ*; these, in certain species, almost equal the bract in length and proportions, excepting that in the case of those having bracts volute at the base, the bracteoles are, I think, not to the same extent free below their attachment. In none of the Indian *Utriculariæ*, however, do the bracts and bracteoles assume anything like the development of those of the singular section '*Orchidioides*' (A. DC.), a South American group of the genus, in which they are relatively very long, attaining a length of from ¼ to ¾ in.

labium inferius versus curvato et idem subæquante. *Capsulæ* globosæ lobis calycinis ovatis rotundatisve sæpe inæqualibus plus minus obtectæ, seminibus peltatis 5–6-angulatis.

β, *Coromandeliana* (A. DC. Prodr. viii. 4.), forma tantum mihi incognita.

B. *Scapus nudus vel squamis paucis instructus.*

2. U. flexuosa, *Vahl, En. Pl.* i. 199. (U. fasciculata, *Roxb. Fl. Ind.*; *Wall. Cat.* 1499; *Wight, Icones,* t. 1568.—U. inæqualis, *Benjamin in Linnæa,* xx. 304 (exempla cujus cum schedulis auctoris in *hb. Hook.* vidi, forma mera gracilior *U. flexuosæ*).—U. ramosa, *Vahl? Ind. or.*; *Kœnig, hb. Mus. Brit.?*)

Loc. Per totam regionem tropicam. Ludihana, *Edgew. in hb. Bth.*! Assam (Goalpara, &c.) *hb. Wall.*! *hb. Hook.*! Silhet, *hb. Wall.*! Nipalia, *hb. Wall.*! Malabar, *Wight*; Bengalia, *Rxb. in hb. Mus. Brit.*! Travancore, *hb. Wall.*! Ceylonia (C. P. 2089), *Thwaites*! Tavoy, *hb. Wall.*! Mergui, *hb. Griff.*!

Forma gracilis:—Ceylonia (sub nom. *U. vulgaris,* Macrae), *hb. Hook*! Burdwan! Chittagong, *J. D. H. et T. T.*! Malacca, *Cuming,* 2278!

Vesicæ natantes (vel axes foliacei potius abnormaliter dilatati sæpe 2-unc. longi lineares) foliolis capillaribus multisectis passim instructæ (ut in *U. inflata,* sp. occid.) prope basin scapi in verticillum infrequenter dispositæ sunt.

Pedicelli primum erecti fructiferi sæpius deflexi. *Calyx* lobis fructiferis accrescentibus divergentibus sæpe plus minus inæqualibus. *Calcar* breve curvatum v. porrectum obtusiusculum, corollæ labio inferiore late ovato palato (fid sched. in hb. Wight) valde prominente macula aurantiaca notato brevius longiusve. *Semina* peltata plerumque 5–6-angulata.

U. confervifolia, *Don, Prodr. Fl. Nep.* p. 84, specimen auct. imperfectum cujus in hb. Mus. Brit. vidi, *U. flexuosæ* valde accedit et verisimiliter eidem referri debet.

3. U. PUNCTATA (*Wall. Cat.* 2121). Scapo 4 unc. ad ped. et ultra pauci- multifloro sæpe elongato cicatricibus minutis pedicellorum bractearumque delapsorum nonnunquam notato, pedicellis gracilibus fructiferis adscendento-patentibus apicem versus erectis bracteis basivolutis suffultis, calycis lobis subæqualibus ovato-rotundatis superiore corollæ labio superiore brevi rotundato integro breviore lobo inferiore calcari crasso subcylindraceo obtuso corollam vix excedente dimidio breviore, capsula ovato-oblonga v. ovata obtusa calycem denique superante, seminibus peltatis suborbiculatis circumalatis margine profunde dentato-laciniatis.—*Wight, Icones,* 1570.

Loc. Tavoy (W. G.), *Wall.*! Rangoon, *hb. Wall.*! Mergui, *Griff. in hb. Hook.*!

Folia demersa segmentis capillaribus dichotome multisectis aciculifera.

Bracteæ ovatæ plus minus acutæ infra medium adfixæ. *Calcar* corollæ labium inferius interdum parum excedens. *Stylus* brevis. *Semina* speciei hujus notabilia et quoad sciam peculiaria sunt.

4. U. DIANTHA (*Rœm. et Sch. Syst. Veget.* i. 169, non *A. DC. Prodr.* viii. 21). Scapo gracili 2–4-unc. vel gracillimo duplo triplove longiore 1–2-floro rarius 3-floro, bracteis parvis amplexicaulibus obtusissimis, pedicellis erectis infimo florem 2–3-plo excedente, calcycis lobis ovatis obtusis subrotundatisve corollæ labio superiore integro late ovato-quadrato v. subrotundato calcarique dimidio brevioribus, calcari cylindrico-conico corollæ labium inferius subæquante v. excedente, capsula subglobosa stigmate minuto sessili, seminibus peltatis alatis 5–6-angulatis.—*Wight, Icones,* t. 1569.

U. biflora, *Roxb. Fl. Ind.* i. 43, non *Wall. Cat.* 1498.—U. Roxburghii, *Sprengel, Syst.* i. 52.—U. elegans, *Wall. Cat.* 1502.—U. pterosperma, *Edgew. Proc. Linn. Soc.* i. 352.—U. Saharunporensis, *hb. Royle.* Conf. U. exoleta, *R. Br.*

Loc. India bor.-occ. *hb. Hook.*! Ludihana, *Edgew. in hb. Bth.*! Nipalia, *Wall.*! Khasia, *J. D. H. et T. T.*! Bengalia, *Roxb. in hb. Mus. Brit.*! Coromandel, *Kœnig*! Quilon, *hb. Wight*!

Parva. *Axis demersus* subramosus segmentis foliaceis capillaceis utriculiferis. *Scapus* nudus v. squamis (1–2) minutis instructus; scapi uniflori bractea vacua sæpe cum axi abortivo v. flore tardo potius ei opposita observatur. *Calyx* lobis parum inæqualibus capsula matura valde brevioribus. *Corolla* labio inferiore integro calcaris basin amplectente eodemque sæpius breviore. A summo corollæ labii superioris ad apicem calcaris 2–3 lin.

The occurrence of an apparently abortive axis or flower-bud on the single-flowered scapes opposite to the bract is, in this plant, as in *U. gibba,* &c. (North American sp.), especially frequent. It is an interesting instance of a secondary superseding a primary axis, and of a definite inflorescence in a group in which an indefinite raceme prevails.

5. U. minor, *Linn.*

Loc. In Tibetia occidentali. Nubra, alt. 11,000 pedum, *T. Thomson*!

Folia demersa di- trichotomo-multipartita utriculifera segmentis linearibus lineari-subulatisve remote subtiliter spinulosis glabrisve. *Scapus* erectus 3–10 unc. (sæpius 4–8 unc.) pauci- multiflorus squamis 2–3 minutis bracteisque basifixis ovatis auriculatis plus minus obtusis instructus. *Pedicelli* post anthesim sæpius arcuato-patentes v. adscendentes calyce 2–4-plo longiores. *Calyx* lobis subæqualibus ovatis obtusis superiore corollæ labio superiore ovato subrotundatove integro breviore. *Corolla* labio inferiore late elliptico obovato-rotundato vel suborbiculato superius 2–3-plo excedente, calcari brevissimo saccato obtusissimo.

A basi calycis ad extremum corollæ labii inferioris 3–4 lin.

It may be proper here to state that I do not admit the specific value of *Utricularia Bremii* (Heer), and doubt further if the *U. intermedia* of British botanists be distinct, except as a mere form or perhaps variety, from *U. minor*, L. It is not improbable that the *U. sacciformis* of Benjamin (*Linnæa*, xx. 302) may refer to this plant; I have not, however, seen authentic specimens.

§ II. *Scapus basi foliis linearibus, lineari-spathulatis v. spathulatis, integris, ante florescentiam sæpe evanescentibus. Calyx lobis æqualibus, interdum parum inæqualibus.*

A. *Scapus squamis, bracteis bracteolisque basifixis instructus.*

a. *Glabra. Calcar conico-subulatum v. subulatum, dependens, sæpius plus minus curvatum. Calyx fructifer, lobis capsulam obtegentibus.*

* *Flores violacei, purpureo- v. albo-cærulei.*

6. U. ALBO-CÆRULEA (*Dalz. in Kew Journ. Bot.* viii. 279). Floribus paucis, pedicellis floriferis erectis subpatentibusve calcar subæquantibus fructiferis curvato-deflexis, calycis lobo superiore late ovato acutissimo corollæ labio superiore albo suborbiculato integro emarginato v. retuso marginibus reflexis breviore, lobo inferiore calcari dependente subulato acuto sæpius valde breviore, labio inferiore corollæ amplo subintegro v. emarginato calcar plerumque duplo excedente.

Loc. Concan, *Stocks*! (In rupibus prope Vingorla, fl. temp. pluviali, *Dalz. l. c.*)

Fragrans (fid. *Dalz. l. c.*). *Radices* sparse ramosæ, utriculis paucis. *Scapus* 3–10 unc. (sæpius 4–5 unc.), teres, erectus, firmus gracilisve, squamis raris parvis ovatis instructus. 1–2-florus, nonnunquam elongatus 4–5-florus. *Bracteæ* ovatæ acutæ. *Flores* primum approximati. *Corolla* labio inferiore (fide descript. opt. *Dalz. l. c.*) quadrato-orbiculari emarginato, palato macula pallida venosa antice 3-lobata notato. Capsula globosa v. sacciformis calycis lobis accrescentibus pedicello demum leviter decurrentibus obtecta. *Stigma* sessile. *Semina* minuta, oblonga v. ovata, utrinque obtusa v. subsphærica, scrobiculato-reticulata.

Corolla a summo labii superioris ad apicem calcaris 4–6 lin., a basi calcaris ad extremum labii inferioris 4–7 lin.

Ab *Utriculariis* alteris affinibus, floribus paucis, corollæ amplæ albo-cæruleæ labio inferiore calcar valde excedente, pedicellis fructiferis denique curvato-deflexis, dignoscitur.

7. U. ARCUATA (*Wight, Icones*, t. 1570–1). Floribus paucis, calycis lobis subæqualibus superiore paulo majore late ovato v. cordato-ovato corollæ labio superiore suborbiculato obovato-orbiculato v. obcordato

integro v. plus minus profunde emarginato breviore, lobo inferiore ovato calcari 3–4-plo breviore, corollæ labio inferiore amplo integro rarius emarginato calcar longum gracile lineari-subulatum dependens v. falcato-curvatum subæquante.

α. Corollæ labio superiore bilobato, calcari dependente, pedicellis calcar vix excedentibus.

β. Corollæ labio superiore suborbiculato integro subintegrove, calcari sæpius arcuatim curvato, pedicellis florem æquantibus v. paulo excedentibus.

Loc. α. Bombay, *Jacquemont* (565 [a]).

β. Malabar, *Law*! Concan, *Stocks*! Belgaum, *Law*!

Flores cærulei (*Wight, Icones, Not.* [a] 1571); mihi corollæ (in specc. exsicc.) labium inferius deorsum pallide violaceum palatum flavum (?) versus pallescens videtur. *Radices* ramosæ utriculiferæ. *Folia* brevia, lineari-spathulata v. spathulata, obtusa, utriculis nigris interdum instructa, sub anthesin pauca nullave. *Scapi* 3–10 unc. (sæpius 3–5 unc.), erecti, nonnunquam bifidi, squamis paucis (2–3) minutis ovatis. *Pedicelli* fructiferi, adscendentes v. arcuato-patentes, apicem versus leviter marginati. *Capsula* ovata v. elliptica, stigmate sessili v. subsessili. *U. albo-cœrulea* et *U. affini*, quibus proxima est, calcari gracillimo corollæ labium inferius æquante, distinguitur.

Planta Jacquemontiana forsan ad speciem distinctam pertinet.

8. U. AFFINIS (*Wight, Icones*, t. 1580. f. 1). Scapo pauci- multifloro, pedicellis brevibus plus minus arcuato-adscendentibus vix patentibus nunquam deflexis, calycis lobis subæqualibus superiore late ovato v. orbiculato-ovato acutissimo v. cuspidato, inferiore ovato calcari subfalcato dependente conico-subulato acuto v. acutiusculo valde breviore, calycis fructiferis lobis plus minus rotundatis apiculatis acutiusculis v. obtusis, lobo majore sæpius suborbiculato orbiculato-cuspidatove, corollæ violaceæ v. cæruleæ labio superiore obovato-cuneato subobovato vel late oblongo integro emarginatove calyce paulo breviore v. longiore, labio inferiore integro v. emarginato calcar sæpius subæquante, seminibus plus minus profunde scrobiculatis.

α. Scapo sæpius 3–8 unc. floribus primum paucis postea 5–7, pedicellis calycem subæquantibus, corollæ labio superiore sæpius plus minus obovato emarginato v. integro. Corolla a summo labii superioris ad apicem calcaris sæpius 3–4 lin., a basi anteriore calc. ad extremum labii inferioris 1½-3 lin.—*U. decipiens*, Dalz. Kew Journ. Bot. iii. 279; conf. *U. acuta*, Benj.

β. Scapo 1½–4 unc. 1–4-floro, pedicellis brevissimis bracteam vix excedentibus, labio corollæ superiore obovato emarginato. A summo corollæ labii inferioris ad apicem calcaris 3–4 lin., a basi calcaris anteriore ad extremum corollæ labii inferioris 1½–2 lin.—*U. brachypoda*, Wight, Icones, t. 1578–1. Præcedentis vix varietas, forma mera parva. Cf. *U. graminifolia*, MSS. β. Nov. Cambria (Cape Grafton), 1770, in hb. Mus. Brit.

γ. Scapo majore erecto v. subvolubili 6 unc. ad ped. et ultra 3- multifloro, foliis gramineis linearibus v. lineari-spathulatis obtusis, pedicellis fructiferis calycem æquantibus sæpius remotis, corollæ labio superiore oblongo v. subobovato integro v. subintegro. Petala cærulea albo lineata (fid. *not. in hb. Griff.*).—*U. Griffithii*, Wight, Icones, t. 1576; *U. intricata*, hb. Griffith.

Loc.:—*a.* Concan, *Dalz.*! *Stocks*! *Law*! In montibus Nilghiri, *Wight, hb*! Maulmein, *Lobb, hb. Hook.*!—*β.* Quilon, *hb. Wight*!—*γ.* Malacca, *hb. Wight*!

Distr. Borneo ins., *Barber*!

Radices parce utriculiferæ. *Folia* ante anthesin plerumque decidua, in var. γ. nonnunquam persistentia, sæpe 1–1½ lin. lata. *Scapi* sæpius erecti teretes, squamis paucis bracteisque ovatis ovato-lanceolatisve, pedicellis plerumque subremotis remotisve. *Capsula* ovata v. elliptica, stigmate subsessili.

Characteres diagnostici formis speciei hujus communes, in colore scapi &c. (in specc. herb.) pallide viridi, pedicellis brevibus suberectis v. curvato-adscendentibus, calycis loborum fructiferi forma plus minus rotundata acuta, et seminibus sæpe profunde scrobiculatis, inveniuntur. *U. graminifolia* (Nov. Cambria, *Banks et Solander*), MS. in hb. Mus. Brit., forsan ad eandem referri debet.

9. U. CÆRULEA (*Linn. herb.*, non *A. DC. Prodr.* viii. 19). Scapo firmo v. gracili erecto v. subvolubili 2 unc. ad ped. et ultra (sæpius 3–8 unc.) 1–8-floro, squamis paucis (in var. *β.* valde numerosis) bracteisque ovatis sæpius acuminatis, pedicellis fructiferis gracilibus erectis adscendentibus v. laxe adscendenti-patentibus nunquam deflexis calycem demum æquantibus v. excedentibus, calycis lobo superiore ovato acuminato corollæ labio superiore obovato oblongo-obovato v. orbiculato-obovato (in var. γ. angustiore oblongo obtuso) integro breviore vix longiore, calycis fructiferi lobis ovatis acutis v. acuminatis, seminibus minutis reticulato-striatis.

a. Scapo firmo v. gracili 2–8–10 unc., racemis denique elongatis floribus remotis remotiusculisve, pedicellis fructiferis calycem æquantibus v. excedentibus erectis v. erecto-patentibus, labio superiore corollæ sæpissime obovato, inferiore plerumque plus minus adscendente.—*U. pedicellata*, Wight, l. c. t. 1578. f. 2; *U. conferta*, Wight, l. c. t. 1575.

β. Scapo sæpe firmiore squamis ovatis acutis numerosis instructo, floribus paucis subterminalibus, pedicellis rectis calycem subæquantibus. —*U. squamosa*, Wight, l. c. t. 1579 (an forma tantum?).

γ. Elongata. Scapo gracili v. volubili, pedicellis gracilioribus laxe adscendenti- v. arcuato-patentibus, corollæ labio superiore angustiore, &c.—*U. uliginoides*, Wight, l. c. t. 1573.

Loc.:—*a.* In montibus peninsulæ: Concan, *Stocks*! *Law*! Nilghiri, *Foulkes*! *Schmid*! Pulney, *hb. Wight*! Courtalam, *hb. Wight*! In Ceylonia (*C. P.* 2086), *Thwaites*! –*β.* Sispara, *hb. Wight*!—γ. Courlam, *hb. Wight*!

Species variabilis, formis extremis valde dissimilibus. *Folia* spathulata v. lineari-spathulata plerumque ante anthesim evanescentia. *Scapus* squamis raris ovatis acutis acuminatisve (excepta var. β) instructus, firmus, debilis v. subvolubilis. *Flores* quam in *U. reticulata*, *U. albo-cærulea*, et *U. arcuata* minores, corollæ labio inferiore integro sæpius adscendente calcar conico-subulatum subæquante.

Pedicellis gracilibus plus minus adscendentibus vix marginatis calyce fructifero rarius brevioribus plerumque longioribus, corollæ labio superiore integro et sæpissime obovato, dignoscitur. (*U. Smithiana*, herb. Wight, mihi forma præcedentis major videtur.)

10. U. RETICULATA (*Smith, Exot. Bot.* 119). Scapo ped. et ultra volubili v. breviore firmo erecto, calycis lobo superiore ovato acutissimo cuspidatove corollæ (excl. var. β) amplæ labio superiore ovato obtusissimo v. ovato-rotundato integro marginibus reflexis breviore (in var. β idem æquante v. paulo superante), calcari subulato dependente, calyce fructifero accrescente marginibus pedicello deflexo (v. in forma β patente) sæpius decurrentibus.

Species magnitudine scapi florumque valde variabilis: sub tribus modificationibus occurrit. *Folia* linearia, ante anthesin sæpius decidua. *Corolla* cærulea v. violaceo-cærulea, labio inferiore faucem versus pallido v. albido nervis coloratis longitudinaliter et transverse striato, calcari pallido v. albido.

a. Scapo 6 unc. ad ped. et ultra sæpissime volubili squamis bracteisque ovatis acutis acuminatisve instructo, pedicellis fructiferis patentibus v. sæpius deflexis apicem versus marginatis calycem æquantibus v. interdum 3–4-plo excedentibus, floribus remotis remotiusculisve, calycis lobis fructiferis valde accrescentibus, sæpe 3–4 lin. latis, late ovatis acutis, corollæ labio superiore ovato apice rotundato v. ovato-orbiculato integro calycis lobum superiorem superante et marginibus reflexis fere obtegente, labio inferiore amplo galeato integro v. emarginato calcar rectum v. vix curvatum subulatum acutum æquante v. sæpius valde excedente, capsula ovata v. elliptica calyce accrescente obtecta, seminibus ovatis oblongisve striatis reticulato-striatisve.

Corolla magna, a basi calcaris ad extremum labii inferioris (in herb. sp.) sæpe 6–8 lin.—*A. DC. Prodr.* viii. 19; *Wight, Illust.* ii. t. 143; *Rheede, Hort. Mal.* ix. t. 70; *Wall. Cat.* 1493.—U. cærulea, *hb. Heyn., Wall.*

Forma occurrit cum scapo erecto v. volubili 3–8 unc., floribus paucioribus. An plantæ typicæ forma junior? *U. spiricaulis*, Miq. Pl. Hohen. 574.; *U. uliginosa*, Wight, Icones, t. 1574 (in parte).

β. (*stricticaulis*). Scapo erecto firmo 2-5 unc. nonnunquam longiore, squamis plus minus acutis, pedicellis fructiferis marginatis calycem accrescentem æquantibus v. brevioribus bracteam paulo excedentibus, adscendentibus vel deflexo-patentibus, calycis lobis denique ellipticis acutis deorsum angustatis.

Corolla, quam in forma typica, valde minor. labio superiore calycem æquante v. breviore, inferiore calcar subæquante, calcari calyce breviore vix longiore. *U. cæruleæ* interdum non parum similis, sed corollæ labio superiore calyce breviore, habitu firmiore, pedicellis sæpius brevibus firmis distinguitur.—*U. cærulea*, var. *stricticaulis*, Kœnig in hb. Mus. Brit.; *U. uliginosa*, Vahl, En. Pl. i. 203.; *U. humilis*, Heyn., Wall. Cat. 1495; *U. polygaloides*, Edgew. l. c. 351.

Loc.:—*a*. In Ceylonia, *Walker*! (C. P. 2090) *Thwaites*! (sub nom. *U. cæruleæ*) *Macrae*! Nilghiri, *Lobb*! Malabar, *Pl. Hohen.*! Mysore, *Buchan.*, *hb. Mus. Brit.*! Concan, *Stocks*! *Law*! Forma *U. spiricaulis*, Miq. (v. supra). Prope Mangalore, *Pl. Hohen.*! Quilon, *hb. Wight*! Concan, *Stocks, &c.*! Ceylonia (C. P. 2091), *Thwaites*!—β (*stricticaulis*). In Ceylonia, *Walker*! (C. P. 2088) *Thwaites*! Coromandel, *Kœnig, &c.*! Mysore, *hb. Wall.*! Bengalia, *Edgew.*

11. U. SCANDENS (*Benj. MS. in hb. Hook.* (in parte), *non Linnæa*, xx. 309). Scapo tenuissimo volubili squamis paucis minutissimis ovatis instructo, pedicellis remotis subremotisve sæpe brevissimis v. calycem æquantibus, fructiferis plerumque deflexis, calycis lobis paulo inæqualibus superiore breviore ovato-orbiculato corollæ labium superius obtusissimum integrum v. subemarginatum subæquante, lobo inferiore ovato calcari conico-subulato dependente paulo breviore, calycis fructiferi lobis obtusis obtusiusculisve capsulam ovatam v. ellipticam subæquantibus.

U. minima, gracillima. *Scapus* 1–4 unc. sæpe volubilissimus. *Bracteæ* minutæ, ovatæ, subacutæ v. obtusæ. *Flores* cærulei, plerumque remoti, pedicellis brevibus vel fructiferis calycem subæquantibus. *Stylus* brevis. *Semina* minuta, reticulato-striata, scrobiculata.

A summo corollæ labii superioris ad apicem calcaris circiter 2 lin.; calyx fruct. $1\frac{1}{4}$–$1\frac{3}{4}$ lin. longus.

Loc. Prope montes Maduræ, Madras, *hb. Wight*!

Formæ minori *U. Wallichianæ* (quacum a Benj. confusa est) similis, sed calcycis lobis fructiferi plus minus obtusis parum inæqualibus, pedicellis deflexis, corollæ colore, &c. ab eadem dignoscitur.

In the 'Linnæa' (vol. xx. p. 309), Benjamin describes a *Utricularia* under the name of *U. scandens*, quoting as a synonym '*U. volubilis*' of the Hookerian herbarium. Referring to this collection, I find a sheet upon which are mounted two very distinct species of *Utricularia*. To each of these is a label attached bearing the name '*U. scandens*, Bj.,' I believe, in the handwriting of its author. To the specimens of one of these species the name *U. volubilis*, quoted by Benjamin, had been previously affixed: it is to this plant, moreover, that his description applies; and from these specimens it was most probably framed. These latter, however, are obviously referable to the voluble and slender variety of *U. Wallichiana*, Wight, while the other examples belong to the very different plant which I have here described, additional specimens of which were met with in Dr. Wight's herbarium. I have thought it better not to import a new specific name for the species, trusting that, if this explanation be accepted, the old one may be retained.

** *Flores flavi.*

12. U. bifida (*Linn. herb.*). Scapo sæpius erecto 2–10 unc. 2- multifloro, squamis paucis, pedicellis brevibus marginatis fructiferis nutantibus bractea brevioribus v. parum longioribus, calycis lobo superiore ovato v. ovato-rotundato obtusiusculo corollæ labio superiore quadrato-oblongo ovato subobovatove integro paulo breviore, lobo inferiore ovato obtuso v. bidentato calcari breviore, corollæ labio inferiore integro v. emarginato calcari dependente paululo falcato-curvato breviore v. subæquante, capsula sæpius globosa v. ovata calycis lobis accrescentibus demum ovato-rotundatis obtusis obtecta, seminibus plerumque ovatis oblique striatis.

U. biflora, *Wall. Cat.* 1498.—U. antirrhinoides, 1498 *b*.—U. diantha, *A. DC. Prodr.* viii. 21.—U. Wallichiana, *Bj. Bot. Zeit.* 1845, 213.—U. humilis, *Wight, l. c.* t. 1572. f. 2. (U. humilis, *Vahl. En. Pl.*?)

Loc. In Ceylonia, *Walker*! *Wight.* Malabar et Mysore, *Wight.* Chittagong, *J. D. H. et T. T.*! Silhet, *hb. Wall.*! Nipalia, *Wall.*! Tavoy, *Wall.*! Malacca, *Griff. hb. Wight*!

Distr. China, *Nelson, in hb. Mus. Brit.*! Ins. Philip., *Cuming*, No. 2289 (sec. *Benj. in Linnæa*, xx. 303); sp. nova, *U. brevicaulis*, Bj., sphalmate, *hb. Hook*!

Scapus squamis bracteisque ovatis plus minus acutis instructus. *Radices* fibrosæ, parce utriculiferæ. *Folia* lineari-spathulata, sub anthesin nulla subnullave. *Capsula* globosa v. ovata, stylo brevi.

Ab omnibus affinibus satis diversa; discrepat corollæ colore flavo, calycibus fructiferis obtusis nutantibus pedicello brevi denique plus minus decurrentibus.

13. U. Wallichiana (*Wight, Icones*, t. 1572. f. 1 (male), non *Benj.*). Scapo stricto v. volubili firmo v. gracillimo 1–2- multifloro, floribus remotis subremotisve, pedicellis erectis adscendentibusve calcar subæquantibus interdum longioribus laxe patentibus, calycis lobis subæqualibus, fructiferis accrescentibus ovatis acutis v. cuspidatis, floriferis superiore late ovato v. ovato-orbiculato cuspidato v. acuminato corollæ labium superius plus minus obovatum v. rotundatum integrum (in var. γ submarginatum) subæquante, calcari subulato dependente sæpe falcato-curvato corollæ labium inferius integrum v. subretusum plus minus excedente v. æquante, calycis lobo inferiore calcari interdum 2–3-plo longiore (in var. γ æquilongo v. parum longiore).

β. Scapo gracili v. capillaceo sæpe volubili, floribus remotis pedicellis adscendentibus patentibusve.—*U. scandens*, Benj. Linnæa, xx. 309, &c.

γ (*firmula*). Scapo 1–3-unc. 1–3 floro, corollæ labio superiore integro v. subemarginato, calcari calycem sæpe parum excedente.

Loc. In regione temperata montium peninsulæ, Himalaya &c.—α. Courtalam, *Wight.* Madras, *hb. Wall.*! Khasia, *J. D. H. et T. T.*!

Sikkim, inter *Sphagna*, alt. 9000 ped., *J. D. H.*!—β. In montibus Nilghiri, *hb. Wight*! Courtalam, *hb. Wight*! Sirra Mullay, *hb. Wight*! Arcot, *Hunter, hb. Hook.*! Khasia, *J. D. H. et T. T.*!—γ. Khasia, *J. D. H. et T. T.*! Sikkim ad Lachoong, alt. 10–11,000 ped., *J. D. Hooker*!

Radices utriculiferæ. *Folia* per anthesin subnulla, linearia v. lineari-spathulata, in var. γ petiolis interdum utriculiferis. *Scapus* squamis 1–4 minutis ovatis v. ovato-lanceolatis acutis instructus (*U. macrolepis*, Wight, l. c. t. 1580. f. 2), forma cum floribus (?) abortivis squamis scapi suffultis). *Bracteæ* acutæ v. acuminatæ. *Pedicelli* sæpissime erecti v. erecto-patentes, fructiferi apicem versus calyce decurrente plus minus marginati, floriferi calcar æquantes v. excedentes. *Calyx* lobis ovatis superiore latiore acutissimo cuspidatove, inferiore acuto v. minute bidentato calcari sæpius valde breviore. *Corolla* aurea flavescensve, labio superiore (var. γ excepta) integro. *Capsula* ovata v. elliptica, stigmate sessili, seminibus minutis striatis v. reticulato-striatis.

Forma typica a summo labii corollæ superioris ad apicem calcaris 4–5½ lin.

b. *Calcar cylindricum vel conico-cylindricum, plus minus porrectum.*

* *Scapus, &c., pilis laxe patentibus hirtus.*

14. U. HIRTA (*Klein, in hb. Willd.? vide Link, Jahrbuch*, i. 55.) Scapo gracili 1–6 unc. sæpius 1–2-floro, pedicellis bracteis calycibusque laxe subpatentim pilosis v. pilosiusculis, pedicellis brevissimis bracteam vix excedentibus, corollæ labio superiore obovato oblongo-obovato v. quadrato-oblongo integro obtusissimo calycem sæpius duplo excedente, calcari conico v. conico-cylindrico adscendente v. porrecto corollæ labio inferiore plus minus longiore, capsula matura calycem subæquante.

U. setacea, *Wall. Cat.* 6398, non *Michx.*

Loc. Khasia, *J. D. H. et T. T.*! Hb. Madras, *in hb. Wall.*!

Scapus erectus debilisve, raro triflorus, sæpe uniflorus, squamis paucis bracteis bracteolisque angustis lineari-subulatis subulatisve. *Calyx* lobis æquilongis ovatis obtusiusculis. *Stigma* sessile. *Semina* minuta reticulata.

Corolla cærulea v. purpurea, venosa, faucem versus et in calcari albida v. flavescens. A basi calycis ad apicem calcaris porrecti 2–3½ lin.

Ab *U. racemosa* et affinibus, quibus habitu similis, scapo calycibusque laxe hirtis, ceterisque valde diversa primum distinguitur.

From the small number of specimens of the Wallichian *U. setacea* which I have seen, and their rather imperfect condition, I may err in determining it to be identical with the Khasia species. Of the latter, however, I have had an abundant series through my hands; and upon these my description rests.

*** Scapus glaber.*

15. U. CAPILLACEA (*herb. Wight, Wall. Cat.* 6399). Species mihi non optime cognita. Scapo tenuissimo 1–2 unc. interdum bifido sub anthesin foliis nullis, squamis paucis minutis, floribus 1–3, pedicellis brevissimis bracteam ovatam v. lanceolatam acutam æquilongis v. parum excedentibus, calycis glabri lobis ovato-rotundatis vix acutis, superiore majore corollæ labio superiore breviore, labio inferiore corollæ (3-lobato v. integro?) calcari cylindrico porrecto obtuso breviore.

Loc. ——?

Incerta: corollæ color, labiorum corollæ forma.

B. *Scapus squamis bracteisque basi-volutis; capsula calycem subæquans vel excedens.*

a. *Pedicelli fructiferi capsula non breviores, sæpius longiores; bracteolæ nullæ; capsula calycem superans.*

16. U. VERTICILLATA (*Benj. in Linnæa,* XX. 312). Scapo 8–12 unc. erecto 4- multifloro, pedicellis floriferis fructiferisque adscendenti-patentibus, calycis lobis subæquilongis obtusissimis v. superiore obtusiusculo subrotundato, corollæ (flavæ?) labio superiore calycem excedente, inferiore calcar dependens subcylindraceum v. cylindrico-conicum subæquante v. paulo breviore, capsula erecta globosa, seminibus minutis scrobiculatis.

U. bifida, *Wight, l. c.* t. 1584. f. 2.

Loc. Malacca, *Griff. hb. Wight*! *Hook.*! &c.

Radices fibrosæ, parce utriculiferæ. *Folia* ante anthesin plus minus decidua. *Scapus* sæpe bifidus v. subramosus, ramis erectis, squamis bracteisque plus minus utrinque acutis v. basi obtusiusculis. *Pedicelli* fructiferi capsula sæpe longiores, cæsio-puberulenti. *Stigma* sessile v. subsessile.

Corollæ color et forma labiorum incerta sunt; planta tamen ab affinibus satis distincta, et characteribus præcedentibus facile dignoscitur.

b. *Pedicelli brevissimi, cum bractea subæquilongi. Squamæ et bracteæ mediofixæ, utrinque acutæ; bracteolæ minutæ v. bracteam æquantes. Calyx lobis minute puberulis. Corollæ calcar plus minus porrectum.* (Nigrescentes.)

** Corollæ calcar labio inferiore non longius.*

17. U. ROSEA (*Edgew. Proc. Linn. Soc.* i. 352). Scapo 4 unc. ad ped. erecto gracili v. firmo 2- multifloro, squamis paucis pluribusve, floribus subremotis approximatisve magnitudine valde variabilibus, calycis purpurei lobis ovato-rotundatis subæqualibus, superiore corollæ labio superiore rotundato obtusissimo integro plus minus breviore, calcari

porrecto crasso cylindrico-conico v. cylindrico obtusissimo labio inferiore breviore eodemque plus minus obtecto.

U. racemosa, *Wight, l. c.* t. 1584. f. 1; *Benj. in Linnæa*, xx. 307.—U. cærulea, *A. DC. Prodr.* viii. 19.

Loc. In Bengalia, *Edgew.* Ceylonia, *Walker*! *Gardner*! (C. P. 2085) *Thwaites*! Montibus Pulney, *hb. Wight*!

Radices fibrosæ, utriculis paucis nullisve. *Folia* spathulata v. lineari-spathulata, ante anthesin sæpe evanescentia. *Scapus* interdum bifidus. *Pedicelli* brevissimi, bracteam æquantes v. parum excedentes, bracteolis minutis lanceolatis a basi plus minus volutis. *Corolla* (purpurea v. rosea?) labio inferiore cucullato striis 4 latis pulchris notato (fide sched. in hb. Hook.) calcar obtegente. *Capsula* globosa v. subglobosa, calycem æquans v. parum excedens, seminibus minutis. *U. racemosa* (Wall. Cat. 1496) varietas? cf. *U. complanatam*, Wall. Cat. 1497.

U. rosea, Edgew., is known to me solely from the description in the 'Proceedings of the Linn. Soc.' (*l. c.*); I may therefore err in referring to the same form the plant occurring in the South and Ceylon, As noted above, perhaps both may be forms of *U. racemosa*, Wall. Cat. 1496, although I scarcely consider them as such.

** *Corollæ calcar labium inferius excedens.*

I desire especially to draw the attention of Indian botanists to the forms which group themselves under this subsection. Notwithstanding the extensive suites of specimens illustrative of most of these, together with the other aids which have been freely and most liberally afforded me, I feel myself, after devoting no little anxious care to their study, quite unable satisfactorily to adjust or subordinate them. While, on the one hand, I fear to unite them under one presumed species (the extreme forms of which, however, would by no means present structural differences irreconcilable with the reasonable adoption of such a course), on the other, from the variability of those parts which alone can afford characters not common to the whole series, I cannot, with a fair confidence, say between which groups a line may be most suitably drawn. Therefore, although I incline to the opinion that there may be of these two (or perhaps three) species, under existing circumstances I have thought it the safer course to pursue, to indicate merely the groups which I conceive may not improbably be of specific value, without, however, positively attributing such import to them.

Characteres omnibus communes.

Folia lineari-spathulata v. spathulata. *Scapus* erectus, debilis vel subvolubilis, floribus paucis v. numerosis. *Calyx* lobis subæqualibus ovato-rotundatis rotundatisve, superiore sæpe obtusiusculo v. subapiculato corollæ labio superiore integro v. emarginato plerumque breviore. *Corolla* labio inferiore cucullato integro v. subintegro calcaris

porrecti basin amplectente. *Capsula* globosa v. subglobosa, calycem æquans v. parum superans, stylo brevissimo, seminibus numerosis minutis.

18. U. RACEMOSA (*Wall. Cat.* 1496). Scapo erecto v. nonnunquam debili 2 unc. ad ped. et ultra (sæpius 6–12 unc.) 1- 2- multifloro, calycis lobo superiore inferiorem parum excedente, labio corollæ superiore subovato ovato-oblongo v. quadrato-ovato plus minus abrupte obtuso integro v. subemarginato calycis lobo superiore sæpe duplo longiore, labio inferiore corollæ calcari porrecto crasso subcrassove conico-cylindraceo v. conico plus minus obtuso v. oblique obtusiusculo breviore, capsula globosa calycis lobos subæquante.

Loc. Chittagong, *J. D. H. et T. T.*! Silhet, *hb. Wall.*! Ceylonia, *Walker*! Maulmein et Mergui, *Griff. hb. Hook.*! &c.

Flores magnitudine valde variabili. Corolla in exemplis e montibus Khasiæ purpurea (fid. *sched. J. D. Hook.*).

Utricularia (e Concan, *Stocks coll.*) floribus paucioribus 1–5 (sæpius 1–3), scapo 2–6 unc., corollæ labio superiore plus minus oblongo v. elliptico-quadrato obtuso integro calycis lobo superiore ovato-rotundato v. rotundato subapiculato longiore.

Corollæ recentis color incertus. An forma *U. racemosæ*, Wall.?

19. U. NIVEA (*Vahl*(?), *Wall. in Rxb. Fl. Ind. ed. Carey*, i. 144, ex *Wall. l. c.*). Scapo suberecto circiter 6 unc. filiformi interdum bifido fructifero elongato volubili, floribus parvis 4–8, corollæ labio superiore brevi lineari emarginato, inferiore calcari conico adscendente fere duplo breviore, capsula globosa.

Loc. In oryzetis prope Serampore.

Corolla alba palato flavescente.

20. U. FILICAULIS (*Wall. Cat.* 1501). Scapo filiformi erecto 2–4 unc. paucifloro, calycis lobis subæqualibus ovato-rotundatis obtusis v. superiore obtusiusculo, corollæ labio superiore integro v. emarginato (ex descr. A. DC. "oblongo obtuso integro") quam calycis lobus superior vel parum longiore vel breviore, calcari porrecto cylindraceo v. cylindrico-conico quam lobus inferior non parum longiore.

Loc. Tavoy, *W. G. hb. Wall.*!

Utricularia scapo erecto capillaceo 1–4 unc. 1–4-floro, calycis lobis æqualibus subæqualibusve, superiore ovato-rotundato subapiculato v. obtuso, inferiore subrotundato, corollæ labio superiore lanceolato v. oblongo integro obtuso calycis lobum superante, inferiore cucullato integro, calcari conico-cylindrico vel fere subulato porrecto v. adscendente, capsula subglobosa calycem æquante v. superante, stylo brevi, seminibus minutissimis obsolete reticulato-striatis.

Loc. In montibus Khasiæ, *J. D. H. et T. T.*!

Corolla pallida lilacina (fid. *sched. cum sp.*). An ad *U. filicaulem*, Wall., referri debet?

Indeterminatæ (Nigrescentes).

U. squamosa, *Bj.* (*Bot. Zeit.* 1845, 212).
U. paucifolia, *Bj.* (*Linnæa*, xx. 309).
U. obtusiloba, *Bj.* (*l. c.* 312).
U. albiflora, *Griff.* (*Notulæ*, iv. 168).

§ III. *Folia sub anthesin persistentia, reniformia, orbiculata v. orbiculato-spathulata. Calyx lobis valde inæqualibus, inferiore minore. Corolla labio inferiore non galeiformi plus minus lobato.*

Plantulæ e rosula foliorum stolones v. ramulos graciles repentes utriculiferos sæpe emittentes. (*Semina sæpe* (*semper* ?) *appendiculata, pilis elongatis v. spinulis* (*cellulis testæ productis*) *capitatis glochidiatisve plus minus instructa.*)

A. *Folia reniformia v. orbiculato-reniformia.*

21. U. BRACHIATA (*sp. nova*). Scapo nudo gracillimo erecto v. adscendente 2–4 unc. sæpius 1-floro rarissime 2-floro, foliis reniformibus gracili-petiolatis, corollæ labio inferiore quinque-lobato, lobis lateralibus superioribus divergentibus linearibus obtusis, lobo inferiore centrali valde latiore subquadrato rotundatove plus minus abrupte obtuso.

Loc. In Himalaya orientali temperata, prov. Sikkim, Lachen, inter muscos, alt. 8–11,000 ped., *J. D. Hooker*!

Species elegans. *Radix* fibrosa, ramulis repentibus gracilibus interdum parce utriculiferis. *Folia* petiolis basin versus gracillimis. *Bractea* minuta, basi-soluta v. adnata, pedicellum gracilem calcar v. florem æquantem gerens, cum bracteolis lanceolatis v. latioribus, acutis v. obtusis, v. minute denticulatis. *Calyx* purpureus, lobo superiore late orbiculato emarginato v. retuso (forsitan interdum integro) lateribus inflexis lobum inferiorem obovatum valde excedente. *Corolla* alba, labio inferiore infra faucem macula flava notato, superiore minimo bilobato v. profunde emarginato laciniis obtusis v. minute emarginatis calycis lobum superiorem æquante v. paulo breviore, corollæ labii inferioris lobi laterales inferiores sæpius distincti, obtusi, nonnunquam vix prominentes. *Calcar* dependens v. subcurvatum, lineare, obtusum, calycis lobum inferiorem 3–4-plo excedens, corollæ labio inferiore brevius.

Folii reniformis lamina cum petiolo sæpe $\frac{1}{2}$–$\frac{3}{4}$ unc. longa, corollæ lobis superioribus labii inferioris plus minus linearibus divergentibusque, ab *U. orbiculata* dignoscitur.

A basi calcaris ad extremum corollæ labii inferioris 3–4 lin. Folia interdum 2–3 lin. lata.

B. *Folia orbiculata v. orbiculato-spathulata.*

22. U. ORBICULATA (*Wall. Cat.* 1500). Foliis orbiculatis orbiculato-

spathulatisve petiolatis, scapo tenuissimo 2–4 unc. 2–4-floro interdum elongato multifloro (8–12), corollæ lilacinæ labio superiore brevissimo minute bilobato bidentatove calyce breviore, inferiore quinquecrenulato-lobato lobis obtusis æqualibus subæqualibusve v. interdum lobulis duobus superioribus majoribus tribus inferioribus minoribus, calcari dependente lineari-subulato labium inferius æquante, seminibus ovatis ovato-oblongisve cellulis productis glochidiatisve testæ plus minus armatis.

U. glochidiata, *Wight, l. c.* t. 1581. (U. striatula, *Sm.*?)

Loc. In Ceylonia, *Gardner*! *Walker*! *&c.* Cochin, *Johnstone*! Concan, *Law*! Khasia, *J. D. H. et T. T.*! Nipalia, *Wall.*! Tavoy, *in hb. Wall.*! Maulmein, *Lobb*! (Forma lobis corollæ labii inferioris distincte inæqualibus) Maulmein, *Parish*! Prope Malacca, *Griff. herb.*!

Pulcherrima. *Scapus* nudus v. squamis (1–2) minutis basi-solutis instructus. *Pedicelli* calcari longiores v. breviores, fructiferi sæpe laxe patentes v. dependentes. *Calyx* lobo superiore late rotundato plus minus emarginato v. integro capsulam globosam parum superante, inferiore valde minore suborbiculato ovato demum deflexo.

Corolla lilacina, fauce flavo (fid. *sched. Parish*).

Corollæ labium inferius basi 2–4 lin. latum, nonnunquam latius, magnitudine valde variabile.

I am unable to satisfy myself of the identity of this plant with the *U. striatula* of Smith, from the imperfect examples preserved in the Smithian herbarium or the British Museum. If they be not the same species, they are certainly very closely allied, as already noted by Benjamin, who, indeed, quotes Smith's name as synonymous with *U. orbiculata*. Benjamin is certainly in error in describing the lower lip of the corolla in the latter plant as 4-lobed.

23. U. MULTICAULIS (*sp. nova*). Cæspitosa, scapo firmo nudo 1–2 unc. 1–3-floro, foliis orbiculato-spathulatis petiolatis, pedicellis ante anthesin sæpius cernuis per anthesin tamen erectis, corollæ carneæ labio superiore brevissimo semi-orbiculato integro emarginatove, inferiore 4-lobato vel 3-lobato lobo inferiore centrali plus minus profunde emarginato, interdum sub-6-lobato lobulis duobus lateralibus superioribus sæpe dentiformibus subnullisve, calcari crassiusculo dependente conico-cylindrico obtusiusculo labio inferiore sæpius breviore.

Loc. In Himalaya orientali temperata, prov. Sikkim, locis paludosis, Lachen, alt. 11,500 ped., Lachoong, 6-7000 ped., *J. D. Hooker*!

Species minima, cæspitose crescens. *Scapi* stricti, fere robusti, conferti, pedicellis subcrassis fructiferis erectis v. cernuis calyce sæpe 3–4-plo longioribus. *Bractea bracteolæque* minutæ lanceolatæ v. oblongæ, vix acutæ, basi-solutæ. *Calyx* lobo superiore late rotundato primum integro, postea (a læsura?) sæpissime bilobato v. bidenticulato, inferiore obovato-orbiculato emarginato v. minute denticulato. *Corolla* carnea, fauce flavescente (ex *sched. J. D. H.*), lobulis labii inferioris sæpius plus minus angustis oblongisve nunquam patenti-divergentibus. *Capsula* globosa, calycem subæquans v. excedens, stylo nullo. *Semina* satis maturata non certe observavi.

A basi calcaris ad extremum corollæ labii inferioris 1–1½ lin. Scapus sæpius 1–1½ unc. longus.

24. U. FURCELLATA (*sp. nova*). Minima, scapo gracillimo ¼–1½ unc. 1–2-floro, corollæ albæ labio inferiore forma lobata varia sæpius quadrilobato laciniis duabus inferioribus æqualibus obtusis subemarginatisve, superioribus lateralibusque brevibus obtusis interdum minutis subnullisve (labio tunc bilobato), calcari dependente subulato quam calycis lobus inferior 3–5-plo longiore labium corollæ inferius æquante v. excedente, seminibus pro planta tantula magnis ovatis ad extremitatem crassam cellulis testæ productis glochidiatis v. capitatis instructis.

Loc. In montibus Khasia, Boga Panee, *J. D. H. et T. T.*! Prov. Sikkim, Lachen, ad rupes humidas, *J. D. H.*!

Folia orbiculata, petiolata. *Scapus* rarissime 3-florus, nudus, bracteis bracteolisque minutissimis ovatis oblongisve acutis obtusisve basi vix solutis. *Pedicelli* graciles, calcari breviores v. longiores. *Flores* parvi, albi. *Calyx* lobo superiore late orbiculato sæpe emarginato lobum inferiorem oblongum v. obovatum apice interdum denticulatum valde excedente. *Corolla* labio superiore calyce breviore plus minus bilobato v. emarginato, inferiore 2- v. 4-lobato vel (segminibus inferioribus plus minus coalescentibus) subtrilobato. *Calyx* fructiferus, lobo inferiore denique sæpius deflexo. *Capsula* calyce brevior. A summo calycis lobi superioris ad apicem calcaris 1½–2 lin.

Formam majorem notavi (in coll. Darjiling, "*E. I. C.*") 1–3-floram, calcari longiore, corolla lobo inferiore calyci æquilongo v. paulo excedente, foliisque late orbiculatis.

Ab affinibus dignoscitur calcari dependente subulato recto v. vix curvato acuto, corollæ labio haud 5-lobato, seminibus et foliorum forma.

25. U. KUMAONENSIS (*Oliver*). Minima, scapo ½–2 unc. 1–3-floro, foliis orbiculatis orbiculato-spathulatisve petiolatis, corollæ labio inferiore 5-lobato, lobo centrali valde latiore subquadrato emarginato v. integro, lobis lateralibus parvis linearibus v. lineari-oblongis obtusis plus minus divergentibus, calcari dependente subcylindraceo v. cylindrico-conico obtuso obtusiusculove quam labium inferius paulo breviore, capsula subglobosa calycem æquante v. subæquante, seminibus (ut in præced.) magnis testæ cellulis sæpe papillæformibus e seminis apice plus minus longe capillaceo-productis.—*Diurospermum album* (Edgew. in Linn. Proc. i. 351) verisimiliter conjungi debet (vide obs. supra).

Loc. In Himalaya occidentali temperata, Pilti fl., alt. 7,500 ped., *Strachey et Winterbottom*! (? *Diurosp. album* "super rupes madidas in Vishnu Gangetis valle," alt. 8,000 ped., *Edgeworth, l. c.*)

Pedicellus infimus demum patens v. adscendens, calyce 2–3-plo longior. *Bracteæ bracteolæque* minutissimæ, a basi vix solutæ. *Calyx* lobo superiore suborbiculato corollæ labium superius excedente, inferiore valde minore subrotundato calcari 2–3-plo breviore. A basi posteriore calcaris ad extremum corollæ labii inferioris 1–2- lin.

Ab *U. brachiata* (cujus semina matura non certe vidi) differt, foliorum forma præsertim, statura minore, et a ceteris sectionis hujus seminibus longe-appendiculatis vel corollæ labii calcarisque forma.

Utriculariæ Indicæ mihi non satis cognitæ.

26. U. MINUTISSIMA (*Vahl*). Scapo capillari 2–3 unc., squamis raris bracteisque (ut mihi videtur) basifixis, floribus parvis paucisque subremotis, pedicellis brevissimis bracteam æquantibus v. parum excedentibus, calycis lobis vix æqualibus subobtusis.

Loc. Malacca (*in hb. Smith.* vidi).

27 (?). UTRICULARIA (Madras coll. No. 52). Habitu *U. reticulatam* revocans, differt corollæ labio superiore ovato elliptico vel subrotundato marginibus reflexis *emarginato*, calcari labium inferius *æquante* v. interdum non parum *excedente*.

That this paper may embrace all the Indian members of the natural order *Lentibulariæ*, I append to the foregoing monograph of the *Utriculariæ* a notice of the only species of *Pinguicula* hitherto discovered in India.

PINGUICULA, *L.*

1. P. ALPINA, *L.*

Loc. Himalaya alpina; Sikkim, alt. 10,000–13,000 ped., *J. D. Hooker*! (? Kumaon, alt. 11,000, ped., *Strachey et Winterbottom*). Planta Kumaonensis (exempla fructifera tantum, *in hb. Hook.* vidi) verisimiliter ad speciem eandem pertinet.

The occurrence of this plant in the Himalaya is an interesting extension of its area towards the south and east.

Regarding the *P. flavescens* of Flörke as a form of the same species, we may trace it from the north of Scotland, through Scandinavia, and Northern and Central Russia, to the Urals, and the vicinity of Lake Baikal. At more considerable elevations it crosses Europe from the Pyrenees, through the Alps, Austria, &c.

I do not discover any material difference between Dr. Hooker's specimens, aided by a coloured drawing from the fresh plant, and the European series of *P. alpina* in the Hookerian herbarium. The Sikkim specimens are almost or quite glabrous, of the stature of *P. vulgaris*, and with pale yellowish-white flowers, bearing a yellow spot in the throat.

On Five New Plants from Eastern Peru. By RICHARD SPRUCE, Esq. Communicated by GEO. BENTHAM, Esq., V.P.L.S.

[Read March 3rd, 1859.]

I. WETTINIA ILLAQUEANS, *a new* PALM *from the Peruvian Andes.*

Among the many interesting plants discovered by M. Pœppig in his downward journey from the sources of the Huallaga to the mouth of the Amazon, none was more remarkable than the undescribed Palm which he gathered "in Transandine Peru, in the beautiful shady woods which border the northern bank of the river Tocache," and which was afterwards published by himself and M. Endlicher under the name of *Wettinia augusta.* Its place in the system was considered doubtful by Endlicher, who left it at the end of *Pandaneæ*, with the remark that it afforded a passage from Screw-pines to Palms, and would perhaps be ultimately reckoned among the latter. I have been on the look-out for this plant from the day of my entering the forests of the Huallaga; and though I have not yet seen the original species, nor have reached within 100 miles of Pœppig's locality for it, I have found what is obviously a second species of the same genus, which has enabled me to decide that *Wettinia* must definitively be stationed among the true Palms. I have been so many years away from books, that I know not how botanists now-adays distribute the genera ascribed to Screw-pines by Endlicher and Kunth; but I believe that the American have been separated from the Eastern genera, and, as it appears, with perfect justice. In fact, the American plants, formerly referred to as Screw-pines, seem to me to constitute two distinct orders, each of equal value with *Palmaceæ* and *Pandanaceæ*, viz. 1st, *Phytelephantaceæ*, which are (so to speak) palms with an inferior ovary; and 2nd, *Cyclanthaceæ*, whose inferior ovary alone separates them from Arads. *Wettinia*, however, is far removed from both these; the fruits are superior, and though so densely crowded on the spadix as to suggest the inferior concrete fruits of *Phytelephas*, there is no real resemblance to the latter. The habit, the ringed stems, the male and female flowers, the structure of the ovary and fruit, are in every respect as in Palms. *Wettinia Maynensis*, like *W. augusta*, has entirely the aspect of an *Iriartea.* The straight, smooth, ringed stem, of 30 to 40 feet high, is supported on a cone of emersed prickly roots 3 feet in height; the petioles are dilated into long, tubular, entire sheaths; and the broad pinnæ are præmorse, and cut at the extremity. It differs notably from the Iriarteas, in the short spadices, so densely clad with hairy fruits as to have suggested to the prurient imagination of the Peruvians the name by which this palm is known in Maynas—*Púllo-coróto* (i. e. "testiculi hirti").

Wettinia Maynensis differs from *W. augusta* chiefly in the more numerous pinnæ (38–40 pairs, while in *W. augusta* they are but 18–20 pairs), and in the spadices, which are only three from one leaf-ring, and put forth 5–8 fastigiate branches at their apex; while in *W. augusta* they are simple, and as many as from 8 to 15 grow from the same ring. There is a further difference, in the spathes, which in *W. Maynensis* are 6 in number, the three outer (corresponding to what are called by Martius in other genera "spathæ incompletæ") much smaller, and persisting on the peduncle in the form of sheaths; while the three inner and larger ones ("spathæ completæ") fall away before the fruit is ripe, or persist only in fragments. In *W. augusta* the spathes are said to be two, and the peduncle is said to be furnished with remote coriaceous sheaths—undoubtedly the remains of the incomplete spathes. In both specimens the sepals vary in number, and the stamens are from 12 to 16, nor does there seem to be much difference in the form of the fruit; but in *W Maynensis* the arilliform raphe is in every stage thin and papery, while in *W. augusta* it is fleshy. In Endlicher's description, the scale-like external sepals are considered bracts; but as they quite correspond to what are called sepals in other palms, I describe them as such.

On comparing Endlicher's description of the ovary of *W. augusta* with that of *W. Maynensis*, given below, there is an apparent difference, which at first sight might be supposed even generic; but when the two species come to be compared, I expect it will turn out to be no difference at all. In *W. augusta* the ovary is said to be solitary, and the style is inserted "prope ovarii basin eodem cum ovulo latere"—an abnormal position in palms. In *W. Maynensis* the ovaries are 3, concrete at the base with each other and the central style; two of them are mostly sterile, and at the time of ripe fruit might be taken for a mere thickening of the base of the style, along with which they persist, of course laterally to the fertile carpel. I have no doubt that the same structure obtains in *W. augusta*, and that the sterile ovaries are either obsolete or have been overlooked from their minuteness.

From the detailed description of *W. Maynensis*, an idea may be obtained of the affinities of *Wettinia* among the genera of palms. If we are guided by the triple ovary, then it must be stationed in *Coryphinæ*; but the only genus described by Kunth in this tribe with pinnate leaves is *Phœnix*, which, besides being very different in habit, has the stamens never more than 9, and a sessile stigma on each ovary. But if we be guided by the sum of all the characters, we shall place it next the genus which most resembles it in habit, viz. *Iriartea*. *Iriartea* has the same emersed cone of roots, the obliquely præmorse and incised pinnæ, the numerous stamens; one species (*I. setigera*) has setulose fruit; and a seed of *I. exorrhiza* placed by the side of one of *Wettinia Maynensis*, is scarcely distinguishable—it is veined in the same way by the vessels of the rhaphe, and the embryo has the same position. If the spathes are not the same in number in the two species of *Wettinia*, so also are they different in nearly every species of *Iriartea*; in *I. setigera* they are 4 or 5, in *I. exorrhiza* 5 or 6, and in *I. deltoidea* 10 to 12. Lastly, as the ovaries of *Wettinia* are concrete at the base with each other and the central style, they may, and perhaps ought to, be looked on as a deeply 3-cleft ovary, analogous to the 4-cleft ovary of Labiates; and then the difference from the 3-celled ovary of *Iriartea* will not appear so very great. The character of the spadices of *Wettinia*, previously alluded to, though striking at first sight, does not disturb the affinity with *Iriartea*.

Hence we may either place *Wettinia* in Coryphinæ, and consider it analogous to *Iriartea* in Arecinæ, or, by another classification of the genera of palms, place it actually by the side of *Iriartea*.

Wettinia Maynensis is not unfrequent at the head of valleys in the Maynensian Andes*, both north and south of the river Mayo, at an elevation of from 3000 to 4000 feet, where it grows in company with the Chonta† (*Euterpe oleracea?*), the Tarapoto (*Iriartea ventricosa*, Mart.; the *Paxiuba barriguda* of Brazil), and another *Iriartea*, which is perhaps *I. deltoidea*, Ruiz et Pav., though, having not yet seen perfect flowers and spathes, I am not certain about it. When the people go to cut palmitos in the time of Lent, they sometimes mistake the *Wettinia* for the Iriarteas, which have edible palmitos, while that of the *Wettinia* is very bitter and may be distinguished from the others by its striped appearance (caused by the vertical imbrication of the young pinnæ), whence it is often called *Shúllu-chonta.* The *Huácara-póna*, or Horn-palm (*I. exorrhiza*, Mart.), though frequent in the moist woods of the plain, I have not yet seen at the same elevation as the palms above-mentioned.

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* I apply the term "Maynensian Andes" to so much of the eastern slopes of those mountains as was comprehended in the ancient province of Maynas. They are watered by the lower part of the Huallaga till it emerges into the great Amazonian plain through the Pongo of Chasuta, and by some of its principal tributaries, especially by the Mayo, which, taking its rise a little eastward of Chachapoyas, passes Moyobamba and Lamas, and enters the Huallaga near Tarapoto.

† The name "Chonta" is applied in Maynas to two species of *Euterpe*, and also to the *palmito* or terminal bud of all palms.

I proceed to give the characters of the two species of *Wettinia*, and a description of *W. Maynensis*, drawn up from fresh specimens. I abstain from offering an amended character of the genus until I shall have an opportunity of examining specimens of *W. augusta*, and perhaps of other species which yet remain to be discovered.

WETTINIA, *Pœpp. et Endl. Nov. Gen.* ii. 39, t. 153 et 154 *a–i*; *Kunth, Enumer.* iii. 109 et 589.

W. AUGUSTA (*P. et E.*). Rhizomate conico e radicibus arcte sibi invicem impositis conflato; pinnis 18–20-jugis; spathis propriis 2; spadicibus simplicibus pluribus (8–15), ex eodem verticillo ortis; rhaphe arilliformi carnosa.

Hab. "In Peruviæ Transandinæ sylvis pulcherrimis obumbrantibus, quibus arcetur ripa borealis fluvii Tocache." (*Pœppig, loc. cit.*)

W. MAYNENSIS (*Spruce*). Rhizomate conico, e radicibus inter se liberis dissitiusculis conflato; pinnis 38–40-jugis; spathis propriis 3; spadicibus apice congesto-ramosis, paucis (sub 3), ex eodem verticillo ortis; rhaphe arilliformi tenui.

Hab. In convallibus Andium Maynensium umbrosis, præcipue secus rivulos, alt. 3000′–4000′, sociis *Iriartea ventricosa* Mart. et *deltoidea* R. et P. (?).

Descr. *Caudex* radicibus strictis subaculeatis e terrâ emersis et in conum 3 pedes altum conniventibus sustentus, erectus, inermis, 30–40-pedalis, diametro 4-unciali, annulatus; annulis latis, spatio 4 unc. sejunctis. *Frondes* 5 v. 6 contemporaneæ, patulæ, ambitu lanceolatæ, obtusæ, basi in vaginam prælongam 3½-pedalem integram subventricosam dilatatæ, glabræ. Rhachis 9¼-ped., supra triangularis, subtus semiteres, basi solâ subcanaliculata, et a basi ipsâ pinnata. Pinnæ 38–40 paria, subæquidistantes; infimæ diminutæ; mediæ 3-pedales, latitudine 3-unciali, angulo 40°–50° insertæ, basi semiverticales reduplicatæ cuneatæ, dein dimidiato-lineari-lanceolatæ, apice obtusato- v. truncato-præmorsæ, margine antico apiceque incisæ, dentibus præmorsis subacutisve; venæ plurimæ, basi fere contiguæ, superne magis

dissitæ, et in dentes marginales alternis vicibus excurrentes, subtus prominulæ costæformes, interspatiis plicâ percursis.

Flores monoici, in diversis spadicibus, plerumque tribus (sc. unico ♀, cæteris duobus ♂), ex eodem verticillo ortis*.

♂. *Spathæ* 6: 3 exteriores cuneatæ, vaginæformes, subtrigonæ, 4-unciales, primitus clausæ, apiculatæ, dein apice irregulariter ruptæ, imbricatæ, persistentes; 3 interiores majores, 11×3-unc., e basi angustatâ stipitiformi fusiformes, apiculo brevi compresso obtuso recurvo, pergameneæ, minute crebre striatæ, arcte imbricatæ, pro spadicis emissione laceræ, caducæ; omnes spathæ pilis brevibus appressis fulvescentibus subdeciduis vestitæ. *Spadicis* stipes 6-unc., obsolete trigonus, fere teres, pro spatharum insertione annulatus, annulo supplementario apicali vaginam bilabiatam (quasi spatham rudimentariam) gerente, in ramos subocto, confertos, simplices, 6-unciales, præfloratione sinistrorsum circinatos postea subrectos, teretes, minute pannosos, spiraliter areolatos, floribus dense obtectos, divisus. *Sepala* squamæformia, crassa, rigida, castanea, subpuberula, tuberculis paucis sparsa, æstivatione valvata; *exteriora* 3–5 (plerumque 4), late subulata, obtusiuscula, lineam longa, libera vel nonnunquam duo in unicum bifidum coalita; *interiora* tria, longissima (7 lin.), anguste subulata, subflexuosa. *Stamina* 12–16 (plerumque 13); *antheræ* paullo supra basin in *filamento* brevi (½–1 lin.) subulato compresso positæ, lineares, 4 lin. longæ, obtuse 4-gonæ, 2-loculares, longitudinaliter dehiscentes, pilis albidis flexuosis deciduis vestitæ, connectivo centrali tenui in mucronem curvulum producto; *pollen* globosum læve.

♀. *Spathæ* iis spadicis ♂ subconformes, ancipites tamen, compressulæ, bilabiatim rumpentes, labiis fissis; 3 interiores, fructibus maturatis, caducæ vel eorum reliquia sola persistentia. *Spadicis* stipes subcompressus, 10-uncialis, adscendens, apice decurvus et ramos 5-7 confertos, fere verticillatos, rectos, patulos, 8-unciales, diametro (fructibus inclusis) fere 4-unciali, proferens. *Sepala exteriora* tria, a basi prælatâ triangulari brevi-subulata, 2–3 lin. longa, inter se subinæqualia; *interiora* tria, late subulata, subflexuosa, 5–6 lin. longa. *Ovaria* tria, ovalia, 3½ lin. longa, basi inter se et cum stylo coalita, villosa, 1-locularia, 1 vel sæpius 2 sterilia; ovulum unicum ex baseos angulo interno fere erectum, sessile, anatropum. *Stylus* unicus centralis, 7 lin. longus, subulatus, subtrigonus, villosus, plerumque cum ovariis abortivis ad ovarii fertilis basin persistens, rarius deciduus; *stigmata* tria teretia, erecto-flexuosa, 3 lin. longa. *Baccæ* 1-spermæ, siccæ, in spadice densissime collectæ, pressione mutuâ 3–6-angulari-obpyramidatæ, apice lato convexo, pilis cinereis, basi solidis subfasciculatis, superne continue tubulosis, flexuosis, villosæ. *Pericarpium* molliter lignosum, tenuiusculum, apice incrassatum. *Endocarpium* membranaceum, rapheos vasibus adhærens. *Semen* 11×6 lin., anguste ovali-obovatum subtrigonum; *testa* tenuis, firma, nigrescens, a basi ad apicem usque rhaphe tenui percursa et ejusdem vasibus albis complanatis adhærentibus reticulata, cum nucleo connata. *Albumen* æquabile, subosseum. *Embryo* in foveolâ basilari nidulans, conico-cylindricus, ad nuclei centrum directus.

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* Spadices, with ripe fruits, are usually found on the fourth ring below the fronds; the other three rings (which are at first very close, but become more distant as the trunk lengthens) have spadices in different stages of growth.

II. DISCANTHUS, *a new genus of* CYCLANTHACEÆ.

DISCANTHUS, gen. nov. Cyclanthacearum.

Char. Gen.—*Flores* monoici in eodem spadice, in seriebus circularibus, masculis cum fœmineis alternantibus, dispositi. *Spathæ* 4, imbricatæ, deciduæ. *Perigonia* florum fœmineorum discis pluribus distinctis bilamellatis spadicem ambientibus constantia; florum masculorum 0. *Stamina* inter perigoniorum annulos vel discos in ordines quatuor structa; *filamenta* omnia ad medium usque inter se coalita, superne libera, antheram paullo breviorem, innatam, linearem, obtuse 4-gonam, bilocularem, longitudinaliter dehiscentem, gerentia. *Laminæ* cujusque disci in facie interiori ovarium continuum, sectione verticali ovato-lanceolatum, gerentes, supra ovarium concretæ (unde ovarium inferum), apice iterum discretæ; margine reflexo minute serrato, nervo e spadicis axi radiante in dentes singulos excurrente. *Ovula* 00, ovalia vel ovata, anatropa, ad ovarii parietes funiculo æquilongo flexuoso adfixa, pluriseriata. *Styli* tot quot perigonii dentes, iisdem subbreviores, lineares, compressi, medio nervosi, in serie unicâ ad cujusque laminæ faciem interiorem accreti, apice solo brevi-ligulato libero intus stigmatoso. *Fructus* e discis pluribus, carnosis, margine unisulcis, interne ad parietes seminiferis, constans. *Semina* 00, ovata, subgibba, breviter obtuse subapiculata, 12-sulcata, rhaphe angustâ apice incrassatâ semicincta. *Testæ* membranæ tres; externa internaque pellucidæ minute cellulosæ, hæc apice brevi-tubulari; media e reticulis parallelogrammis, oblatis, medio depressis, in series 12 longitudinales catenatim dispositis, formata. *Nucleus* ellipsoideus, basi minute mamillatus. *Embryo* rectus cylindraceus, hilo contiguus, in albuminis carnosi basi nidulans.—Herba Peruviana *acaulis*, frondibus *bipartitis*, *facie* Carludovicæ *vel* Cyclanthi; *ab hoc* perigoniis *circularibus nec spiralibus, et* ovulis *ab initio nudis in ovarium continuum collectis, diversa.*

DISCANTHUS ODORATUS, *Spruce.*

Hab. In sylvis humidis Andium Maynensium, prope Tarapoto, præcipue ad rivuli fauces *Pongo del Shillicaio* dictas.

Caudex 0. *Frondes* plures, petiolatæ, erecto-arcuatæ, pallide virides, subtus albo-virides, fere ad basin usque bipartitæ; laciniæ 44×7 unc., lineari-lanceolatæ, subacutæ, angulum 15° inter se formantes, costâ mediâ validâ suprà elevatâ subtus convexâ, venis crebris parallelis, *plicis nullis*. *Petiolus* 4-pedalis tenuiusculus, basi solâ dilatatus am-

plexicaulis, dein trigonus, facie inferiore convexus. *Spathæ* 4, secus spadicis stipitis apicem imbricatæ, ovatæ, concavæ; extima apice foliaceo bilobo; interiores sensim minores, acutæ; intima obtusata. *Flores* odorati. *Spadices* subcylindrici, obtusi, superne paullo tenuiores, 3–4 uncias longi; floriferi 13 lineas, fructiferi 18 lineas crassi; stipite tereti 7-unciali. *Disci* 20, floriferi 3½ lineas, fructiferi 6 lineas lati, 1½ lineam crassi. *Semina* vix ¾ lin. longa.

This remarkable plant resembles the *Cyclanthi* and bifid-leaved *Carludovicæ* in habit, but differs from both in the laciniæ of the fronds having a single strong costa (whence they should perhaps be considered conjugate pinnæ), and in being destitute of plicæ. It is nearly allied to *Cyclanthus*, but differs essentially in the perigonium consisting of distinct disks (and not of a continuous spiral) embracing the spadix, and in the ovules being naked from their first appearance (long before the opening of the flowers), and springing on longish funiculi from the very walls of the disk, while in *Cyclanthus* they are at first contained in small pluri-ovulate ovaries, sessile on the walls of the disk in two rows, and finally become confluent. There would seem to be also a difference in the seeds; but though there is a species of *Cyclanthus* in the forests of Tarapoto, I have seen only its young flowers, and Kunth describes the seeds incompletely. The seeds of *Discanthus* are remarkably 12-sulcate, and traversed from base to apex by a narrow rhaphe, which is not arilliform, as that of *Cyclanthus* is said to be. After fecundation, the stamens fall away, and the disks, increasing in thickness, become contiguous. Half-grown ovules had the micropyle still open, and the amniotic sac separable. Great numbers of acicular rhaphides exist in the cells of the funiculus, rhaphe, and testa; at first they are in bundles, but as the seed ripens they break up from each other.

III. YANGUA TINCTORIA, *a new genus of* BIGNONIACEÆ, *whose leaves are used for dyeing blue by the Peruvians of Maynas.*

YANGUA, gen. nov. N. O. BIGNONIACEÆ. Tribus TECOMEÆ.

Char. Gen.—*Calyx* laxus obpyramidato-campanulatus, ore patulo, profunde 5-plicatus, fere ad medium usque in lobos 5 cuspidatos fissus. *Corolla* basi brevi-tubularis, dein campanulata compressa, antice profunde bisulcata, postice trigona; limbo sub-bilabiato, subæqualiter 5-lobo. *Stamina* 4 didynama, cum rudimento quinti, in corollæ tubi apice inserta, corollâ dimidio breviora. *Antheræ* biloculares, loculis divergentibus. *Ovarium* disco impositum, fusiforme, biloculare. *Ovula* 00, secus septi angulos parietales inserta, subsessilia, globoso-oblonga,

anatropa. *Stylus* corollâ subbrevior, *stigmate* e lamellis duabus erectis ovatis crenulatis formato. *Capsula* siliquæformis, magna, lata, compressa, profunde 12-sulcata, bilocularis, bivalvis, ab apice loculicide dehiscens. *Semina* late alata, pluriseriata, septo parallela, arcte imbricata. *Embryo* planus, exalbuminosus; cotyledonibus oblatis, profunde emarginatis, basi cordatis; radiculâ brevi subulatâ hilo proximâ. —*Arbor* Peruviana *humilis,* Tecomæ *affinis,* floribus *tamen virescentibus,* calyce *laxo 5-plicato, et* capsulâ *insigniter* 12-*sulcatâ diversa.*

YANGUA TINCTORIA, *Spruce.*

Hab. Tarapoto locisque aliis Andium Maynensium, passim pro foliis cæruleo-tinctoriis culta, et nomine *Yangua* a Peruvianis insignita. In sylvis nusquam vidi; et ubi terrarum indigena sit, mihi nondum constat.

Arbor 30-pedalis, erecta; cortice profunde sulcato; ramis dichotomis, ramulis obtuse 4-gonis compressulis, faciebus 1-sulcatis. *Folia* opposita, digitata, in petiolo 8-unciali, plano-convexo, apice haud incrassato. *Foliola* 7, in petiolulo subunciali suprà sulcato, terminale majus $5\frac{1}{2} \times 2$ unc., cætera sensim minora, lanceolata vel subobovato-lanceolata, cuspide longiusculâ unciali et ultrà subacutâ, tenuia, pellucido-punctata, glaberrima, siccando nigrescentia; in stirpe juniori nonnunquam supra medium grosse serrata, in adultiori tamen integerrima; venis paucis, angulo 50° e costâ egredientibus, subtus prominulis, longe intra marginem arcuato-anastomosantibus. *Panicula* brevis e ramulorum novellorum dichotomiâ; ramis cymulas 3–12-floras gerentibus; pedicellis basi bracteolatis. *Calyx* albidus, tenuis, fere membranaceus, laxus, corollæ basi multo latior, 5-plicatus, obpyramidato-campanulatus, ore patulo, fere ad medium usque in lobos 5 brevi-ovatos, cuspide abruptâ tenui nervo fere repletâ terminatos, fissus, 8 lineas longus, seriùs subauctus, longe persistens, ante fructûs maturationem tamen deciduus. *Corolla* pallide viridis, minute puberula, intus tomentella, venis plurimis longitudinalibus percursa, $2\frac{1}{2}$ unc. longa, subcurvata, basi tubulari angustâ calycem vix æquante, dein campanulata, compressa, antice profunde bisulcata, postice obtuse 3-gona; limbo sub-bilabiato, 5-lobo, lobis subæqualibus brevi-ovatis obtusatis subrecurvis. *Stamina* corollæ tubi apice inserta, corollâ dimidio breviora; quinti rudimento subulato fertilibus multoties breviori et paullo inferius inserto; *filamenta* basi glandulis brevi-stipitatis obsessa; *antheræ* lineari-oblongæ, loculis divergentibus. *Ovarium* fusiforme, disco impositum. *Ovula* 00, secus septi margines subsessilia, globoso-oblonga, anatropa. *Capsula* viridis, lineari-fusiformis, acuta, compressa, $9\frac{1}{2}$ unc. longa, 25 lin. lata, 12 lin. crassa, angulis 12 elevatis acutis percursa, ex interstitiis canaliculiformibus 12-sulcata, 2-locularis, ex apice loculicide dehiscens; *septa* binata valvis contraria, margine solo inter se coalita, sed a pericarpio crassiusculo lignoso intus lævissimo soluta, seminum delapsorum cicatricibus notata et ideo limam ferrariam haud male simulantia. *Semina* ad lineas plu-

rimas (spatio 2 lin. sejunctas) a septorum marginibus angulo 45° procedentes, sursum directas, sed ad septorum latitudinis vix tertiam partem attingentes, funiculo brevissimo inserta, sc. 4 ad utramque lineam, in laminas 24 septo parallelas colligata, superiora et lateralia inferioribus et interioribus incumbentia, alâ tenuissimâ 2×1 unc. cincta*; nucleo $3\frac{1}{2}\times 3$ lin. obcordato plano. *Testæ* tenuis firmiusculæ membrana exterior in rugas creberrimas irregulariter transversales elevata, interior ab exteriori embryoneque demum separabilis. *Embryo* planus, exalbuminosus; cotyledones oblatæ, profunde emarginatæ, basi cordatæ; radicula brevis, subulata, hilo proxima.

I first saw the tree above described in January 1851, at Janauarí, in the angle between the Rio Negro and Amazon, where it had been raised from seeds brought from Peru; but it had no flowers or fruit; and I did not again see it until I arrived at Tarapoto in June 1855, when I at once recognized it growing in the gardens, and here and there in the open grounds near the town. I have not yet seen it truly wild, nor can I learn whence it was originally brought. It is planted in all the villages I have seen in the Maynensian Andes, and is especially noticeable in the pretty English-looking village of Morales, where it forms scattered clumps on the verdant plain, accompanied by oranges and limes; by the *Ciruelo* (*Spondias*, sp.); the *Siamba* palm (an undescribed *Œnocarpus* with clustered stems); picturesque old *Huingos* (*Crescentia Cujete*), whose branches are hidden by a dense coating of mosses, ferns, and orchids; and several species of terrestrial figs, whose tortuous trunks are enveloped in a network of their own roots. It is a small tree, scarcely larger than *Sambucus nigra*, which it much resembles in its thick cracked bark, though its regularly forked and somewhat rigid branches give it otherwise a different aspect. When out of flower, it might be passed over for a *Tecoma*, to which it is undoubtedly closely allied; but the green flowers, the large lax plicate calyx, and the broad pods traversed by twelve deep furrows are marks that at once distinguish it from that genus. The inhabitants of Maynas dye the cotton cloths of their own manufacture a permanent blue by simply boiling them along with Yangua leaves. About every three months every leaf that can be got at is stripped off; and the trees seem not to suffer from being thus denuded; but they rarely put forth flowers till they grow beyond the reach of spoliating hands.

* *Ala* seminum inferiorum margine plurisinuata; funiculis seminum superiorum, quibus ala rectangularis margine subintegra adest, per sinus alarum inferiorum egredientibus.

It should be mentioned that the name "Yangua" is given also to two species of *Indigofera*, cultivated sparingly at Tarapoto: they are sometimes called "Tacsha-yangua" (or "small Yangua"), to distinguish them from *Yangua tinctoria*, which is the "Atun- (or great) yangua."

IV. CAPIRONA, *a new genus of* RUBIACEÆ. Tribe, CINCHONEÆ.

Char. Gen.—*Calyx* obparabolicus, compressulus, inferne cum ovario connatus, dimidio superiore liber, ore obtuse 5–6-dentato; florum axillarium dente externo plerumque in laminam phylloideam producto. *Corolla* e basi angustâ tubulosâ, campanulata, subgibba, 15–18-sulcata, 5–6-lobata; lobis cordato-ovatis imbricatis, 3 (vel omnibus) demum reflexis, quasi bilabiata. *Stamina* 5 (raro 6) corollâ duplo breviora; *filamenta* basi in tubulum corollæ tubo adnatum coalita, dein libera *antheræ* lineares, connectivo adnatæ, 2-loculares, longitudinaliter dehiscentes. *Ovarium* inferum, biloculare. *Ovula* 00 in placentis elongatis, sectione reniformibus, dissepimento utrinque insertis, sessilia, anatropa. *Stylus* brevis cum stigmate lineari bilamellato tubum stamineum paullo superans. *Capsula* anguste obovata, calycis limbo coronata, ab apice ad basin septicido-bivalvis. *Semina* 00, parva, tenuia, alâ trapeziformi vel triangulari basi sæpius bilobâ cincta. *Embryo* in axi albuminis carnosi orthotropus; *cotyledonibus* parvis ovalibus subplanis; *radiculâ* tereti hilo proxima.—*Arbor* Peruviana *cortice castaneo deciduo, stipulis intrapetiolaribus, floribus magnis Bignonioideis,* Calycophyllo *proxima*; *huic tamen sunt* flores *multo minores,* corolla *brevi-campanulata symmetrica omnino esulcata, lobis concavis fere fornicatis nunquam reflexis, et* filamenta *corollæ æquilonga cum eâdem ad loborum basin usque concreta, haud in tubulum coalita.*

CAPIRONA DECORTICANS, *Spruce.*

Hab. Tarapoto et aliis locis secus fl. Huallaga, in sylvis primævis recentioribusque, solo arenoso. *Capirona* Peruvianorum dicta est.

Arbor pulchra 30–40-pedalis, apice parce patule ramosa; ramulis subteretibus; cortice castaneo, lævissimo, nitente, lamellis tenuissimis secedente. *Folia* opposita, in petiolo perbrevi 5-lineari, maxima 20 × 10 unc., oblongo-ovalia, apice rotundata vel apiculo brevissimo obtusato terminata, subcoriacea, glaberrima vel in stirpe juniore ad venas et in facie inferiore plus minus pubescentia; venis validis parallelis, angulum 70° cum costâ efformantibus, secus marginem curvatis et anastomosantibus. *Stipulæ* intrapetiolares, 36 lin. longæ, 13 lin. latæ, elongato-triangulari-lingulatæ, acutæ, 2-costatæ, venulosæ, albidæ, submembranaceæ, basi subcordatâ sese imbricantes. *Cymi* ex stipularum superiorum plerumque aphyllarum axillis, subinde paniculam magnam terminalem efformantes; pedunculo 9-unciali v. breviori, apice 3-fido; ramis bis terve bifidis, bracteolâ stipulari ad cujusque rami basin. *Flores* ad ramorum apices axillasque solitarii.

sessiles, ebracteolati, visciduli, subodorati; axillaribus præcocioribus, plerumque (haud semper) dente calycis externo in laminam phylloideam, albidam, 3-costatam, venulosam, convexam, ovalem, obtusatam, 3 × 1½ unc., petiolo 1½-unciali, producto. *Calyx* viridis, obparabolicus, compressulus, obsolete 5-gonus, semuncialis, dimidio superiore libero persistente, ore dentibus 5–6 obtusis. *Corolla* sesquiuncialis, crassiuscula, extus alba roseo tincta, lobis intus sanguineis, e basi brevitubulosâ 2½ lin. longâ campanulata, subgibba, 15–18-sulcata, ab apice ultra ⅓ in lobos 5–6 cordato-ovatos æstivatione imbricatos vix parum contortos, 3 vel omnibus seriùs reflexis, quasi bilabiata, fissa. *Stamina* 5, basi in tubulum corollæ tubo adnatum ore pilosum coalita; *filamenta* glabra 3½ lin. longa; *antheræ* filamentis æquilongæ, lineares, obtusæ, connectivo adnatæ, ad corollæ loborum basin attingentes, loculis vix basi productis longitudinaliter dehiscentibus. *Ovarium* inferum, disco epigyno crasso cupulari coronatum, 2-loculare; *ovula* plurima, anatropa, secus placentas incrassatas (sectione reniformi) dissepimento utrinque adnatas apice solo liberas, sessilia, imbricata, angulo 45° ascendentia, tenuia, alâ trapeziformi vel triangulari circumcincta, nucleo minuto infra alæ centrum. *Stylus* brevis cum stigmate lineari profunde bilabiato, intus dense papilloso tubulum stamineum paullo superans. *Capsula* anguste obovata, inferne sensim angustata, 10 × 5 lin., apice disco et calycis limbo brevi coronata, leviter 10-striata, e folliculorum marginibus introflexis axi coadunatis demum ab apice separatis 2-locularis; epicarpium tenue badium; endocarpium cartilagineum albidum. *Semina* 00, parva, badia, alâ membranaceâ ovulorum formâ, basi sæpius bilobâ, apice lacerâ vel laciniatâ, nucleo ovali compresso infra-centrali, constantia. *Testa* membranacea firmiuscula arcte venoso-reticulata. *Embryo* ½ lin. longus, in albuminis carnosi axi rectus; *radicula* teres, $\frac{3}{10}$ lin. longa, hilo proxima; *cotyledones* parvæ, $\frac{2}{10}$ lin. longæ, ovales, subplanæ.

This handsome little tree is very frequent near Tarapoto, where it grows chiefly on the lower hills, in a sandy soil. Its trunk is conspicuous among the other trees, from the shining reddish bark, which is continually peeling off in broad thin flakes. In this respect it quite resembles the Mulatto-tree of the inundated shores of the Amazon, which bears in abundance corymbs of small white flowers scented like those of the hawthorn, and in structure very like those of a *Cinchona*. The latter tree, called also "Capirona" by the Peruvians, but "Páo mulatto" in Brazil, has been proposed by Mr. Bentham as the type of a new genus of Cinchoneæ, under the name of *Enkylista*. *Capirona decorticans* has, however, very slight botanical affinity with Enkylista, and stands much nearer to Calycophyllum, from which it is strikingly distinguished by the *large ribbed flowers*, and the much shorter

stamens *combined at the base into a tube which lines the short tubular base of the corolla,*—although it has the same character, of the outer tooth of the calyx of the axial flowers being produced into a leafy lamina, which gives to *Calycophyllum* its name.

There is some analogy to Bignoniaceæ, in the campanulate subasymmetrical flowers with a short tubular base and an approach to a bilabiate limb. Indeed the flowers remind one much of those of *Henriquezia,* which on its side shows an approach to Rubiaceæ in the inferior ovary. The winged seeds of *Capirona* it has in common with the rest of the Cinchoneæ, and with all true Bignoniaceæ.

Enkylista I have seen along the shores of the Amazon for full 2000 miles. It perhaps extends downwards to the very mouth of the river, and it is said to be still abundant above the mouth of the Huallaga. On the latter river it is frequent; and I have traced it by the streams among the roots of the Andes up to a height of about 2000 feet. *Capirona* grows only on dry ground; and I have not yet seen it at a greater elevation than Enkylista, nor anywhere far from the river Huallaga.

The light tough wood of the *Capirona* renders it very suitable for the beams of houses; and the trees are mostly cut down when they have attained a suitable size; so that it is rare to find a well-grown or a flowering specimen.

There is apparently a second species with subpilose leaves, attenuated at the base and apex, and with paler bark, in which a green tinge is always perceptible. It grows rather higher than *C. decorticans,* and is very abundant at Yurúnaguas on the Huallaga; but as I have never seen its flowers or fruit, and could therefore give only an incomplete character of it, I hesitate to signalize it by a distinct name.

V. ERYTHRINA AMASISA, *a new species with follicular pods.*

ERYTHRINA AMASISA (*Spruce*). Arborea, foliolis ovato-rhombeis glabrescentibus, racemis terminalibus brevibus subpaniculatis, calyce truncato, vexillo anguste ovato complicato carinam gamopetalam incurvam triente superante, alis e calyce exsertis, legumine folliculari.

Hab. Tarapoto, in sylvis montium inferiorum præcipue secus rivulos. *A'ma-sísa*[*] a Peruvianis designata est.

Caudex 80–100-pedalis, basi subdilatatus, superne ramosus; *ramis* haud late patulis; *ramulis* verrucoso-scabris cinereo-tomentellis; *cortice*

[*] Query—a corruption of "Amor-sisa," *i. e.* "Love-flower"?

lævi, aculeis brevi-conicis pungentibus obsesso. *Folia* pinnatim 3-foliata; *petiolus* 7-uncialis basi incrassatus; *rhachis* $2\frac{1}{4}$-uncialis; *foliola* in petiolulo semunciali rhombeo-ovata, vix apiculata, subobtusa, juniora pubescentia seriùs glabrescentia; terminale $7\frac{1}{2} \times 5\frac{1}{4}$ unc.; lateralia subminora, eorum petiolulo basi glandulâ stipellari brevi-cylindrica, lineam longa, deflexa, cava, ore truncato aperto instructo. *Folia* inferiora majora et longius petiolata sunt. *Stipulæ* minutissimæ squamæformes citò deciduæ. *Racemi* terminales, 2–6-unciales, cinereo-tomentelli, solitarii vel sæpius plures paniculati. *Pedicelli* 5 lineas longi, seriùs elongati, ebracteolati, basi apiceque articulati, decurvo-secundi, ternatim fasciculati, verticillati, nempe quoque verticillo e fasciculis 3 v. 4 constante. *Flores* penduli, magni, speciosi, miniati, graveolentes. *Calyx* obconico-urceolatus, truncatus, puberulus. *Vexillum* anguste ovale, obtusum, 20 lin. longum, primitus complicatum, dein recurvo-explanatum, apice solo haud evoluto, ungue brevi lato. *Alæ* diminutæ, 3-lineares, ovali-spathulatæ, subobliquæ, erectæ, liberæ, margine exteriore paullo supra basin unidentatæ. *Carina* 14 lin. longa, anguste ovata, apice obtuse bidentata, declinata. *Filamenta* ad $\frac{2}{3}$ usque coalita, inter se subinæquilonga; *antheræ* parvulæ, oblongo-ovales, paullo supra basin adfixæ. *Pistillum* stamina subæquans; *ovarium* stipitatum, tenue, subteres. *Legumen* 4–5-unciale, latitudine semunciali; *pericarpio* tenui subpuberulo. *Semina* plerumque 2 maturata et in folliculis decisis apertis longe persistentia, 3 lin. longa, 6 lin. lata; *testâ* firmâ tenui.

This is the handsomest tree I have seen in the Maynensian Andes. It is frequent towards the mouth of the hill-streams that enter the Mayo wherever any primitive forest has been left. In the very town of Tarapoto, on the rocky banks of the turbulent Shillicaio, rise here and there magnificent trees of Amasisa, which have been spared the axe of the first settlers—some of them as much as 100 feet high. Twice in the year, viz. in March to April, and in August to September, they are clad with large flame-coloured or vermilion flowers, sometimes with no accompanying leaves, and sometimes with young leaves of the most delicate green, just appearing. I have been delighted to walk by the Shillicaio at sunset and observe the tracery of the crown of the Amasisa, with its copious red tassels, projected on the whitish-blue eastern sky, when the flowers of almost every tree showed a different shade of yellow-red, not, however, paling to yellow on the one hand, or brightening to scarlet on the other. It continues in flower nearly two months at a time; and before it has well done flowering, the ripened follicular pods, splitting up one side only and with the seeds still adhering, begin to strew the ground. The wood is white and softish, and of no use but for firewood. The trunk is more or less beset with sharp conical prickles, on which account it is constantly selected by the sagacious Troopial (*Cassicus icteronotus*, Swains.) for its long pensile nests,—though, as if doubting that this were sufficient to render them inaccessible, it hangs them on the very point of the outermost twigs. All the species of Troopial I have seen on the Amazon and Rio Negro, show similar foresight in selecting a place where to rear their infant colonies; and the robber who, observing no impediment from below, ventures to climb to their eyry, finds, to his cost, that it is defended by some large wasps' nest, or by hordes of stinging ants.

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